EHR ADVISORY COMMITTEE MEETING
October 28-29, 2020

Marilyn Strutchens
EHR AC Chair
Emily R. & Gerald S. Leischuck Endowed Professor, Mildred Cheshire Fraley Distinguished Professor, Department of Curriculum and Teaching, Auburn University
National Science Foundation

Dr. Megan Bang
EHR Advisory Committee Member

National Science Foundation
COLLECTIBLE CARDS

Rory Cooper

Bioengineer, Inventor, Veteran, and Athlete
Los Angeles, California

Rory Cooper is a distinguished professor of rehabilitation engineering at the University of Pittsburgh and a senior career scientist for the U.S. Department of Veterans Affairs. His team has developed over 100 inventions and received 25 patents related to technologies including wheelchairs, robots, and wearable instruments that have significantly improved the lives of people with disabilities and military veterans.

Image courtesy of the U.S. Department of Veterans Affairs.

National Science Foundation
My Marathon

‘Being Physically Fit Is What Saved My Life’

Engineering professor Rory Cooper defied an injury and a pandemic to complete his race

On a rainy morning last October, I set out to compete in the Marine Corps Marathon in Washington, D.C., riding a three-wheeled handcycle that I designed with friends and colleagues. Since you publish a handcycle with your arms, this takes upper body strength, as well as an understanding of ergonomics. That said, no matter how strong you are or how carefully designed your bike is, accidents happen.

That morning the pavement was wet, and I took a bad turn at a curve on a ramp. I bounced over a curb, flew across the grass and landed in the bushes. I’ve used a wheelchair since I was paralyzed in an accident at age 20, so I couldn’t leap up and were somebody down to help.

I’m not sure how long I was lying there, but it felt like an eternity. Finally, I realized nobody was coming to save me, so I crawled to my cycle and climbed on. Somehow I made it to the finish line 25 miles later, but I was in rough shape.

It turned out I had broken both feet and legs and had a huge gash on my back, as well as hypothermia. I spent a week and a half in the ICU and long months of healing back home in Pittsburgh. It wasn’t my first long recuperation. In fact, I recently marked the 40th anniversary of my “low day” – the day I was in that accident, a near-fatal road crash by my Army base in Germany, and didn’t die.

I truly believe that being physically fit is what saved my life back then, and I think it’s why I survived my accident last year. Muscle strength and flexibility and cardiovascular strength are important for everyone, whatever your age or physical challenges. So last year, I was back to exercising as soon as the doctors allowed it. I set a goal to hand cycle the 2020 Pittsburgh Marathon in May.

Then the COVID-19 crisis hit. The in-person marathon was canceled, but participants could run (or ride or walk) the 26.2 miles on their own and post their times online. I did it and was able to finish in two hours and 24 minutes.

I may not have been one of the fastest competitors in the hand-cyclist division this year, but I’m certain I was one of the most grateful... – as told to Bobbie Weimer

Rory A. Cooper, Ph.D., is the director of the Human Engineering Research Laboratory, a professor in the School of Industrial and Systems Engineering at Georgia Institute of Technology, and a professor in the University of Pittsburgh’s School of Life Sciences. He is also a member of the editorial board of the journal NeuroEngineering.
New NSF Director,
Dr. Sethuraman "Panch" Panchanathan

National Science Foundation
• National Academies of Sciences, Engineering, and Medicine Symposium Imagining the Future of Undergraduate STEM Education
• Mid-Scale Research Infrastructure for STEM Education Research
• Workshops for STEM Education of the Future
EHR Investments in Core Research and STEM Learning as well as STEM Education Development and Training
If we had an additional $100 million, what is our strategy and our plan?
Industries of the Future

- Biotechnology
- Artificial Intelligence
- Quantum Information Science
- Advanced Manufacturing
- Next Gen Wireless
NSF INCLUDES Planning Grant: Cultivating Research and Equity in Sign-related Technology (CREST)

Diversify STEM faculty and improve inclusive STEM teaching

Broaden participation of graduate students in the physical sciences

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Final Reflections...
Session 1: Improve STEM Learning & Learning Environments During a Pandemic

Moderator:
Evan Heit, Division Director, Division of Research on Learning in Formal and Informal Settings (DRL), EHR

Presentations:
• NSF Recovery Planning Task Force (RPTF)
• Highlights of COVID RAPID Awards
• EHR Post-COVID Working Group
COVID-19 and the Research Enterprise

Steve Meacham, Office of Integrative Activities
Sylvia James, Directorate for Education and Human Resources
Co-chairs of Recovery Planning Task Force

October 28, 2020
Advisory Committee for Education and Human Resources
COVID-19 Research
SARS-CoV-2 Virus and COVID-19 Disease
RAPID Response to COVID-19

- Dear Colleague Letters
  - COVID-19 RAPIDs (NSF 20-052)
  - Provisioning Advanced Cyberinfrastructure (NSF 20-055)
  - SBIR/STTR Phase I Proposals (NSF 20-065)

- CARES Act: $75 million

- NSF made over 900 RAPID & EAGER awards, totaling over $130 million
COVID-19 RAPIDs – Thematic Overview

- Biology of the virus
- Predicting the spread
- Detecting the virus
- Limiting the spread
- Impact of behavior
- Impact on society

Data as of June 25, 2020
COVID-19 RAPIDs – Examples

Biophysical Characterization of the Native SARS-CoV-2 Virion by Atomistic Simulations

Coronavirus Persistence, Transmission, and Circulation in the Environment

Addressing Equity when STEM Teaching and Learning Go Remote

Designing an Educational Intervention to Address Intuitive Misconceptions about COVID-19

Learning: Preparing for the Next Pandemic

From reactive to predictive.
From segmented to interdisciplinary and coordinated.
Research Recovery Planning
Guidance and Flexibility for NSF Grantees

NSF Implementation of OMB Flexibilities

- NSF Important Notice 146 – NSF Letter to the Community Regarding COVID-19
- FAQs for Proposers and Awardees
- FAQs for NSF Panelists
- Implementation of M-20-17 and M-20-20

Impact on Existing NSF Deadlines

- Moved over 30 proposal deadlines

Now, per OMB in M-20-26,
Early-career scientists at critical career junctures brace for impact of COVID-19

By Wudan Yan Apr. 7, 2020, 2:30 PM

Science, April 7, 2020

AAMC, AAU, ACE, APLU letter to Congress, April 7, 2020

April 7, 2020

The Honorable Nancy Pelosi
Speaker
United States House of Representatives
H-232, United States Capitol
Washington, DC 20515

The Honorable Mitch McConnell
Majority Leader
United States Senate
S-236, United States Capitol
Washington, DC 20510

The Honorable Kevin McCarthy
Minority Leader
United States House of Representatives
H-204, United States Capitol
Washington, DC 20515

The Honorable Charles Schumer
Minority Leader
United States Senate
S-255, United States Capitol
Washington, DC 20510

Dear Speaker Pelosi, Majority Leader McConnell, Minority Leader McCarthy, and Minority Leader Schumer:

We represent the leading Washington voices for the research universities, medical schools, and teaching hospitals at the forefront of our nation’s fight against the COVID-19 pandemic. We write today to thank you and the entire Congress for your tireless efforts to mitigate the pandemic’s harmful health, economic, and societal consequences. We are grateful for the relief provided in the recently enacted CARES Act to students and to the colleges, universities, and academic medical centers that serve them through their educational missions, as well as the measures included in the legislation to strengthen the provision of health care and services for millions of Americans.
Research Recovery Planning
COVID-19 pandemic – a major disruptor

- Affects both researchers and research organizations
- Interrupts laboratory and field-based science
- Impairs operation of facilities
- Adversely affects undergraduate and graduate students, postdoctoral fellows, and early-career faculty
- Transforms undergraduate and graduate education
- May disproportionately affect more vulnerable groups and organizations
- Disrupts international collaborations
- Potentially impairs finances of universities and colleges over the medium term
Broad Themes

1. Research Recovery: Mitigating Losses and Catalyzing the Recovery of STEM and STEM Education Research Projects

2. Maintaining the STEM Talent Pipeline: Mitigating losses of STEM talent

3. Ensuring NSF Capacity to Implement Recovery
People and Infrastructure

PEOPLE

- Post-docs
- Graduate students
- Undergraduate Researchers
- Faculty, technicians and other scientific professionals

INFRASTRUCTURE

- Instrumentation and mid-scale infrastructure
- Major facilities: renovation & replacement; facilities’ staff
- Longer-term: increased construction costs for major facilities already underway
- Inclusion and equity
Some questions

How many fewer openings than usual are there likely to be for new assistant professors in non-medical STEM research domains in AY 2020-21 and AY 2021-22?

How many PhD students, currently on NSF research project grants expiring in FY 2021, are likely to be left at the end of the grant without support for their research, as a result of not being able to complete their research due to COVID-19 related delays?

How big is the likely shortfall, compared to recent years, in the number of STEM graduate research students that universities will be able to admit?

What is the likely capacity of universities and colleges to provide summer research experiences for undergraduates?

How is your institution handling differential impacts of the pandemics on faculty research productivity – particularly, early career faculty members?
We welcome your input!
smeacham@nsf.gov
Session 1: Improve Stem Learning & Learning Environments During a Pandemic

Highlights of COVID RAPID Awards

• Ellen Carpenter, Program Director, Division of Undergraduate Education, EHR
• Robert Ochsendorf, Program Director, Division of Research on Learning in Formal and Informal Settings, EHR
• Claudia Rankins, Program Director, Division of Human Resource Development, EHR
• Daniel Denecke, Program Director, Division of Graduate Education, EHR
Addressing Equity when STEM Teaching and Learning Go Remote

(DUE – 2029642) PI: Barbara Means, Digital Promise

General findings:
Decreases in student satisfaction
Decreases in collaboration with other students
Bandwidth/internet connectivity issues

Student-centered challenges:
Motivation
Specific challenges for students from Underrepresented backgrounds

Examples of recommendations:
Breaking up classes into shorter activities
Live discussion sessions
Group work separate from course meetings
Student reflections on what has been learned and what still needs to be learned
Pandemic Learning Loss in U.S. High Schools: A National Examination of Student Experiences

(DRL – #2030436) PI: Jennifer Hamilton, NORC

STEM Teachers did a Good Job

By household annual income

n (weighted) = 744

Change in interest in STEM topics since the start of the pandemic

n (weighted) = 2,024

<table>
<thead>
<tr>
<th></th>
<th>&lt;$75k</th>
<th>$75-124k</th>
<th>$125k+</th>
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<tbody>
<tr>
<td>More interested in STEM topics</td>
<td>6%</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>About the same level of interest</td>
<td>69%</td>
<td>72%</td>
<td>72%</td>
</tr>
<tr>
<td>Less interested in STEM topics</td>
<td>24%</td>
<td>20%</td>
<td>18%</td>
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Effects of the Move to Online Teaching on the Rural HBCU Community due to the Coronavirus (COVID-19) Pandemic

(HRD – #2028573) PI: Felicia Jefferson, Fort Valley State University

- The project investigates the adaptability and educational outcomes of rural HBCU students and faculty who are asked to adopt online course delivery as a result of the COVID-19 pandemic. The effects on student retention and learning, and on faculty turnover are studied.
- The study involves 20 HBCU (and a few HSI) institutions.
- Six graduate student and 9 undergraduate student researchers are involved in this study.
- The PI presented her preliminary survey results at the NASEM workshop on the effects of COVID-19 on STEM education on 9/22/2020.
Graduate Student Experiences: Support & Stress During the COVID-19 Pandemic

(DGE – #2030313) PI: Craig Ogilvie, Montana State University

Surveyed graduate students @ 11 universities (June & July); received 4,000 responses

General Findings:

1. Mental health is at risk
2. Students perceive faculty, but not policies, as supportive of well-being (by 2-to-1 ratio)
3. Educational plans - 25% expect delay of 6+ months in degree completion
4. Career plans - 25% of STEM respondents pessimistic about pursuing career goals

Dissemination: Chronicle of Higher Education article (9/2/20), NSF-funded NASEM Workshop (9/22/20), NORC Workshop (9/29/20, DGE - #2030148)
EHR Post-COVID-19 Working Group Report

Kim E. Barrett, Division Director, Division of Graduate Education
Post-COVID-19 Working Group

• Established by AD Karen Marrongelle in March 2020

• Broad membership:
  • Kim Barrett, Tatiana Camacho, Thomas Higgins, Jennifer Lewis, Vinod Lohani, Robert Mayes, Sarah-Kay McDonald, Nafeesa Owens, Elizabeth VanderPutten, Carol Van Hartesveldt

• Charge was to identify, for EHR
  • New or expanded activities as a direct response to crisis
  • Existing activities that should be accorded a higher priority
  • Activities to prepare for a subsequent pandemic or other crisis

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Landscape and Assumptions

- Wholesale disruptions to education and research
- Disproportionate impact on different populations of learners and researchers
- Sharply curtailed job opportunities for STEM trainees
- Possible loss of STEM education faculty cohort
- Expectation of additional funding for EHR

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Crisis as Opportunity

- Although the impact of the pandemic has obviously been devastating across many dimensions, it also carries opportunities for EHR
  - Sweeps away inertia that may stymie change in institutions as conservative as schools and universities
  - Shines a bright light on disparities that accordingly can no longer be ignored
    - Further amplified by ongoing social unrest
When considering the breadth of EHR’s programs in the context of responding to the pandemic, the working group identified two urgent priorities:

1. EHR should act swiftly to preserve, reinforce and build new pathways to STEM and STEM education careers for those who represent the future of the workforce.

2. EHR should take bold steps to promote research that designs, tests and validates new modalities of educational delivery.

The working group also stressed the overarching importance of addressing inequities in STEM education.
Top-ranked Pathways Initiatives

Increased support for graduate students – particularly those who are close to completing doctoral programs

Provide emerging researchers with training, salary and other support – e.g., postdoctoral programs and early career research funding

Transition programs for K-12 students and undergraduates – e.g., virtual internships and REU’s; micro-credentials and stackable micro-master’s
Top-ranked Research and Development Initiatives

- **New tools for learning in an online environment** – e.g., support of programs that research and develop learning platforms
- **Assessment of learning in the COVID-19 era** – e.g., develop assessments to accurately measure what students (at all levels) are learning in online and informal settings
- **Impacts of COVID-19 on students and academic institutions** – track implications for learning and effects on educators and their institutions in real time
Implementation

• Ideas informed EHR competition for RAPID awards

• Presentation at EHR All-Hands Meeting, May 2020
  • Discussed in break-out groups to ratify high priority items

• Report and feedback from All-Hands Meeting discussed by each division and by DDs

• Racial Equity in STEM Working Group charged by AD
Examples of Outcomes

**Pathways efforts**
- DGE 2030148 (PI: Stewart, NORC)
  RAPID: Ensuring the Success and Sustainability of STEM Graduate Students and Graduate Academic/Research Programs in Response to COVID-19
- HRD 2028811 (PI: Ofori-Boadu, NC Agricultural and Technical State University)
  RAPID: Decision-Making Processes in STEM Students during and after the COVID-19 Pandemic

**Research efforts**
- EHR-CISE updated solicitation: Research on Emerging Technologies for Teaching and Learning (RETTL) (NSF 20-612)
- DUE 2027582 (PI: Lewandowski, University of CO, Boulder)
  RAPID: Examining the Impacts of Transitioning to Remote Teaching of Undergraduate Physics Labs Due to the COVID-19 Pandemic

Supplements to enable PIs to continue program efforts in HBCU-UP and TCUP
Questions for the AC:

• What is your opinion of the broad priorities identified?
• Are there important areas we are missing?
• Do you have additional advice for us as we seek to help our research communities recover and learn from the pandemic?
Questions for Consideration

• As we’ve moved into the fall, where have you seen the greatest impacts of COVID in/on your learning and teaching communities?

• In your opinion, where have NSF’s investments made the most (positive) impact considering this pandemic?

• What else can NSF and EHR do to support our communities during the pandemic and beyond?
Break
2:45 – 3:00PM
Session 2: Opportunities for Racial Equity in STEM Education Panel

Moderator (and Panelist):
Marilyn Strutchens, Chair, EHR Advisory Committee

Panelists:
• **Christopher Jett, Ph.D.**, Associate Professor of Mathematics Education, Department of Mathematics, University of West Georgia
• **Melissa Collins, Ph.D.**, 2nd Grade Teacher, John P. Freeman Optional School
• **Juan Gilbert, Ph.D.**, Andrew Banks Family Preeminence Endowed Professor and Chair of the Computer & Information Science & Engineering Department, University of Florida
Dr. Christopher C. Jett is Associate Professor of Mathematics in the Department of Mathematics, Sciences, and Technology at the University of West Georgia.

His current research project, funded via the National Science Foundation’s CAREER award, investigates African American male STEM majors’ mathematics experiences and career decisions. He is a 2019 recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE) as well as the recipient of the 2019 Early Career Award from the Association of Mathematics Teacher Educators. His scholarship has been published in various journals including the *Journal of African American Studies* and the *Journal for Research in Mathematics Education*, and his work advocates for (continued) racial justice in mathematics education.
Dr. Melissa Collins, 2nd Grade Teacher, John P. Freeman Optional School, Memphis, Tennessee

Melissa Collins has taught second grade at John P. Freeman Optional School in the Memphis City Schools since 1999. In addition to mathematics and science, she teaches reading, grammar, social studies, and spelling. Dr. Collins' recognitions include the John P. Freeman Teacher of the Year award, Memphis Education Association's My Favorite Educator award, Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST), one of six finalists from the United States and top 50 for the Global Teacher Prize, Queen Smith Award, Stephen Sondheim Award, Horace Mann Award for Teaching Excellence, the National Science Teaching Association (NSTA) Sylvia Shurgrue Award, and National Teachers Hall of Fame 2020 Inductee.
Dr. Juan E. Gilbert is the Andrew Banks Family Preeminence Endowed Professor and Chair of the Computer & Information Science & Engineering Department at the University of Florida.

At the University of Florida, Dr. Gilbert leads the Human Experience Research Lab. He is also an Association for Computing Machinery Fellow, a Fellow of the American Association of the Advancement of Science, a Fellow of the National Academy of Inventors, and a Senior Member of the IEEE. He is a recipient of the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM). He is also the PI of the NSF Broadening Participation in Computing (BPC) Alliance: the Institute for African-American Mentoring in Computing Sciences.
Dr. Marilyn E. Strutchens is the Emily R. and Gerald S. Leischuck Endowed Professor, Mildred Cheshire Fraley Distinguished Professor of Mathematics Education in the Department of Curriculum and Teaching at Auburn University.

At Auburn University, she teaches graduate and undergraduate courses and serves as the interim department head of Curriculum and Teaching. Her works show the importance of hearing the voices of the key constituents involved in the mathematics education of students and the school, societal, and race/ethnicity factors that influence students’ achievement. She is the leader for the Clinical Experiences Research Action Cluster for the MTE-Partnership. Dr. Strutchens served on the Board of Directors for the National Council of Teachers of Mathematics (NCTM) from 2015 -2018, president of the Association of Mathematics Teacher Educators (AMTE, 2011 –2013) and a member of the Executive Board of Directors for the Conference Board of Mathematical Sciences (2012 – 2014). She received the 2017 Judith Jacobs Lectureship from the AMTE.
Opportunities for Racial Equity in STEM Education Panel

Dr. Jett  
Dr. Collins  
Dr. Gilbert  
Dr. Strutchens

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What changes do you believe need to happen to reduce the barriers experienced by African Americans, Latinx, and Native Americans in STEM?
What exemplars/models in STEM have worked well to reduce barriers to diversity, equity, and inclusion?

National Science Foundation
Opportunities for Racial Equity in STEM Education Panel

What can NSF and EHR do to make meaningful changes in broadening participation?
Thank you!

National Science Foundation
Session 3: Enhance Broadening Participation while Addressing Barriers to Diversity, Equity, and Inclusion

Moderator:
Diana Elder, Division Director, Division of Human Resource Development, EHR

Presentations:
• NSF INCLUDES
  Sylvia James, Deputy Assistant Director, EHR
• Broadening Participation (BP) Subcommittee
  Okhee Lee, Professor, Steinhardt School of Culture, Education, and Human Development, New York University
NSF INCLUDES Updates

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science

Dr. Sylvia James
Co-Lead, NSF INCLUDES Design Team
Deputy Assistant Director, Directorate for Education and Human Resources

EHR AC Meeting | October 28, 2020
INCLUDES: Making a collective impact to broaden participation in STEM

by Sylvia James, Deputy Assistant Director, Education and Human Resources Directorate, National Science Foundation

Spread the Word

Related Stories

The science behind HSU success
Alliance Long-term BP Outcomes

- Participant STEM attitudes
- Participant STEM knowledge or skills
- Partner satisfaction or level of commitment
- Participant participation in STEM workforce
- Participant satisfaction or level of commitment
- Participant level of STEM coursework or degree attainment
- Partner knowledge or skills to improve broadening participation
Lessons Learned on Building Connections

START WITH A CLEAR STRATEGY
A clear strategy or framework for building partnerships provides a solid foundation for implementing the shared vision of the Alliance.

BUILD CONNECTIONS THROUGH SHARED GOALS
Connecting partners with similar goals can strengthen the Alliances’ work.

ALIGN
Make certain that the role of each community partner is understood and valued throughout the network.

CONTEXT MATTERS
Understand national trends regarding the broadening participation challenge as well as the local context of successes and challenges.

INVOLVE STUDENTS AS LEADERS
Supporting student-leadership within Alliance work will help develop the next generation of informed and equipped leaders to broaden participation.

REMEMBER THE SHARED VISION
State the broadening participation goals frequently and firmly to focus the Alliance’s work.

TIME
Make time, in person, to build relationships.

SHARE
Consistently share the work being conducted by the Alliance internally and externally.
Experts’ Choice Winner for STEM Alliances

Scientific Journal or Graphic Novel?
A Student-Production
Featuring LSAMP Research

Institution/Organization: Ball State
Program: LSAMP

Experts' Choice Winner for PreK-12 STEM Education

Stitching the Loop:
Electronic Textiles for Broadening Participation in CS

Institution/Organization: University of Oregon
Program: ITEST

Experts’ Choice Winner for Informal STEM Education

Emerging Leaders Cohorts:
An Affinity-Based Model for BIPOC in Environmental Education

Institution/Organization: Lawrence Hall of Science
Program: AISE

People’s Choice Winner

SacramentoSTEMAlliance (SSA)

Institution/Organization: SacramentoSTEMAlliance
Program: HSI

Experts' Choice Winner for STEM Higher Education and People's Choice Winner

Advancing Student Success in STEM

Institution/Organization: California State University, Fullerton
Program: HSI
Funding Opportunities Updates

Planning Grants NSF 19-600
Alliance Solicitation NSF 20-569
Planning Grants (NSF 19-600)

The goal of Planning Grants is to **build capacity** for the development of collaborative infrastructure to:

- facilitate innovative partnerships, networks, and theories of action for broadening participation in science, technology, engineering, and mathematics (STEM) at scale; and

- lead to the establishment of future centers, alliances, or other large-scale networks to address a broadening participation challenge.

**Deadlines:** December 3, 2019, **July 13, 2020**
New NSF INCLUDES Alliance Solicitation (NSF 20-569)

Overarching Goal

Support the establishment and growth of new Alliances that employ a collaborative infrastructure approach to address a critical broadening participation challenge in STEM at scale.

• A letter of intent is required for all proposal submissions and must be submitted via Fastlane by the due dates listed on the solicitation.
  (FY21 Deadlines: LOI - October 05, 2020, Full Proposal - January 26, 2021)
  (FY22 Deadlines: LOI - October 04, 2021, Full Proposal - January 25, 2022)

• An NSF INCLUDES Planning Grant is not a prerequisite to submit an Alliance proposal.
NSF INCLUDES Alliances Solicitation NSF 20-569

Considerations

• This solicitation is open to organizations and established networks across the educational continuum (e.g., preK-12, higher education, general public) and contexts (e.g., formal, informal).

• Proposals are especially encouraged that address broadening participation challenges not yet represented in the NSF INCLUDES portfolio of Alliances.

• Researchers and practitioners at minority serving institutions are strongly encouraged to consider this opportunity.

For more information on funded NSF INCLUDES projects, go to go to the NSF Award Search engine and search for NSF INCLUDES.
NSF INCLUDES

Shared Measures Update
The NSF INCLUDES Coordination Hub is a collaboration of multiple institutions with SRI International as the lead. The Coordination Hub helps to foster the overarching vision and strategy of the NSF INCLUDES National Network by facilitating the activities needed to build and maintain the network. The graphic to the left illustrates the Coordination Hub’s five focus areas.

www.INCLUDESNetwork.org
Shared Measures Progress

Framework for Network-wide shared measures

• Measures progress toward identified goals and objectives using a variety of progress indicators
• Includes broadening participation and collaborative infrastructure measures
• Provides coding scheme for synthesizing data from project reports

Prototype Dashboard

• Synthesizes emerging themes
• Provides benchmark for progress and achievements
• Communicates approaches for operationalizing collaborative infrastructure

Working Group

• Comprised of representatives from the Hub Team and the eight funded Alliances
• Co-creating common data collection tools and dashboard for National Network
Role of the Evaluation Team and Coordination Hub

Streams of Evidence

**EVALUATION TEAM** — Evidence for NSF

**Performance Monitoring**
Systematic collection and reporting of longitudinal, quantifiable measures of implementation and success
Aligns to the NSF INCLUDES theory of change with indicators for activities, outputs, and outcomes

**Evaluation**
Formal assessment examining the effectiveness of a program’s design, implementation, and results
Synthesizes data from performance monitoring and other data collection activities

**COORDINATION HUB** — Evidence for the Network

**Shared Measurement**
Network-generated measures critical to systematically informing strategic planning, decision making, and assessment of progress
Involves a participatory process to refine a common set of constructs, indicators, and data collection methods to support the Network’s information needs

**LEARNING AGENDA**
Evidence from performance monitoring, evaluation, and other sources will be used to:
- Understand the National Network
- Influence policy and systemic change across the Network
- Build a knowledge base about BP in STEM and facilitate knowledge transfer

- Internal Studies
- Other Contracts
- Grants
NSF INCLUDES Federal Partners
Engaging Federal Partners
Federal Agency Activities

NASA and NSF INCLUDES
“Building MSI-Led Coalitions to Strengthen Broadening Participation in Engineering.”

Explore broadening participation strategies and partnership opportunities to reach underrepresented populations nationwide

https://www.nasa.gov/stem/murep/includes.html
Thank You!
Update from the Broadening Participation Subcommittee (BPS) of the EHR Advisory Committee

EHR Advisory Committee Meeting, October 28, 2020

BPS Members

Okhee Lee – BPS Chairperson – New York University
Rory Cooper – University of Pittsburg
Marilyn Strutchen – Auburn University
Diana Elder (Senior Leadership Liaison) – NSF/EHR
Sandra Richardson (BPS Executive Secretary) – NSF/EHR

National Science Foundation
EHR Charge to BPS

1. Provide a statement of its vision for BP and the role of EHR in realizing this vision into the future.

2. Make recommendations regarding strategies EHR can use to coordinate their BP efforts within EHR and NSF.

3. Provide guidance on setting priorities for EHR in coordinating their BP efforts.

4. Advise EHR on the selection of metrics for continuous monitoring and assessment of BP efforts, collection of data and information, and reporting requirements.

5. Provide analysis and suggestions in a report to EHR leadership.
Talk the Talk and Walk the Walk … Factors Guiding our Work

1. Using two public documents to frame the report
   ○ NSF-funded workshop report Monitoring Metrics for Programs Focused on Broadening Participation (Clewell & Fortenberry, 2009)
   ○ Committee of STEM Education (CoSTEM) report Chartering a Course for Success: America’s Strategy for STEM Education (National Science and Technology Council, 2018)

2. Terminology
   ○ Deficit undertone associated with use of underrepresented minority (URM)
   ○ Metrics vs Indicators
   ○ Monitoring vs Evaluation
Using CAREER as a Prototype

- BPS originally considered several EHR programs with a BP focus (e.g., LSAMP, AGEP, ADVANCE)

- CAREER emerged as a likely option for the following reasons:
  1. Opportunity to understand impact on URM scholars in the academic profession
  2. Capacity building for STEM education research
  3. Accessible and manageable EHR awardee sample size and scope of data
  4. Potential for developing monitoring metrics to serve as a prototype NSF-wide and other funding agencies

*National Science Foundation*
BPS Report Outline

*Metrics for Monitoring Broadening Participation Efforts in National Science Foundation Programs*

- Section I: Introduction (situated in context of COVID-19 and systemic racism)
- Section II: Vision and Purpose (frames report in context of ongoing NSF/EHR initiatives and investments along with those at the federal level)
- Section III: CAREER Program as Prototype (for developing common metrics for monitoring BP in EHR programs)
- Section IV*: Findings (reported in 3 areas and > 7 monitoring metrics)
- Section V*: Recommendations
- Section VI*: Closing - A New Normal

*Denotes section is in still under development

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Findings in Three Areas, Each with Multiple Metrics

- **Area 1**: EHR CAREER Principal Investigators (PIs)
  - Metric 1.1: CAREER PIs’ Demographic Subgroups
  - Metric 1.2: CAREER PIs’ Participation in NSF Funding in Terms of Submitting NSF Proposals Subsequent to CAREER Awards
  - Metric 1.3: CAREER PIs’ Participation in NSF Funding in Terms of Receiving NSF Awards Subsequent to CAREER Awards

- **Area 2**: Productivity in Terms of NSF Awards Subsequent to CAREER Award
  - Metric 2.1: NSF Proposals PIs Submitted Subsequent to CAREER Award
  - Metric 2.2: NSF Awards PIs Received Subsequent to CAREER Award
  - Metric 2.3: First-Time PI Submitters for CAREER Award
  - Metric 2.4: CAREER Award PIs on 1st, 2nd, or 3rd Submission

- **Area 3**: Productivity in Terms of Publications from CAREER Awards (in progress)
Snapshot of Initial Key Findings Over 10 Years (FY2010 to FY2019)

Metric 1.1: CAREER PIs' Demographic Subgroups
The number of EHR CAREER awards was small – 99 awards

1. **Unknowns:** More than 1 out of 5 demographics were unknown, varying across the demographic groups.

2. **Gender:** The majority of awards were made to females, compared to males and unknowns

3. **Race/Ethnicity:** The majority of the awards were made to Whites, with decreasing percentages to Asians, Blacks, Hispanics, and Multiracial. For those who self-identify as American Indian/Alaska Native or Native Hawaiian/Pacific Islander, no awards were made.

4. **Disability:** No awards were made to those who disclosed disability status.
Metric 2.2: NSF Awards PIs Received Subsequent to CAREER Award
On average, 2.3 subsequent NSF awards

1. **Unknowns:** No consistent patterns across demographic groups.
2. **Gender**
   - Females, mean of 2.2 awards
   - Males, mean of 2.6 awards
3. **Race/Ethnicity:**
   - Hispanics, mean of 2.0 awards
   - White, mean of 2.15 awards
   - Multiracial, mean of 2.3
   - Asian, mean of 2.4
   - Black/African American, 2.5
4. **Disability:** No awards were made to those who disclosed disability status.
Next Steps and Timeline

1. Gather publication data for Area 3 (early November 2020)

2. Complete findings, recommendation, and closing sections of report (early Winter 2020/2021)

3. Send report out for internal review (early Spring 2021)

4. Share final report with AC (May 2021)

5. Dissemination of findings and recommendations (post-Spring AC meeting)
Questions for Consideration

What can NSF and EHR do to make meaningful changes in broadening participation?
Session 4: Preparing for the Future: STEM Education Research and Workforce

Moderator:
Robin Wright, Division Director, Division of Undergraduate Education (DUE), EHR

Breakout Facilitators:
• Robin Wright, Division Director, DUE, EHR
• Lee Zia, Deputy Division Director, DUE, EHR
• Sarah-Kay McDonald, Senior Advisor, EHR
Preparing for the Future

STEM Education Research and Workforce
Diversity, Equity, Inclusion

Evidence-based Instruction & Technology

Personalized  Project-based  Learner-centered

Multiple Pathways Across Transitions & Lifespan

AC Report: STEM Education of the Future
What **understandings** and **discoveries** about STEM education do we need so that the nation can:

- Solve pesky, persistent problems in implementing evidence-based, high-impact STEM education
- Achieve the vision for STEM Education of the Future that will prepare a STEM capable public and the future STEM workforce
<table>
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<tr>
<th>Committee Member</th>
<th>Breakout group</th>
<th>Facilitator</th>
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<tr>
<td>David Monk</td>
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<td>Okhee Lee</td>
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<td>Lee Zia</td>
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<td>James Spillane</td>
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<td>Marilyn Strutchens</td>
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<td>Rory Cooper</td>
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<td>Robin Wright</td>
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<td>Megan Bang</td>
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<td>Cathy Casserly</td>
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<td>Hyman Bass</td>
<td>3</td>
<td>Sarah-Kay McDonald</td>
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<td>Kaye Husbands Fealing</td>
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Break
2:00 – 2:15 PM
Session 5: The Future of NSF

Moderator:
Sarah-Kay McDonald, Senior Advisor, EHR

Presentations:
• OLPA Reorganization
  Amanda Greenwell, Head, Office of Legislative and Public Affairs, NSF
• NSF Strategic Plan
  Sylvia James, Deputy Assistant Director, EHR
OLPA
Telling the stories of discovery

AMANDA HALLBERG GREENWELL
Office of Legislative and Public Affairs
National Science Foundation
I AM AN NSF STORY
MISSION SUPPORT

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

---

Vannevar Bush
4:53 PM May 3rd via twitterfeed

Discoveries: Economists Study How to Improve China’s Food Safety: Graduate student David Ortega describes his res... http://bit.ly/kBG31n
4:50 PM May 3rd via twitterfeed

12:03 PM May 3rd via HootSuite

Partnered w/ NSF and NIH, @SecLocke RT. i6 Challenge, $12M competition for innovative ideas to bring tech to market faster www.eda.gov/i6
7:58 AM May 3rd via HootSuite

2:42 AM May 3rd via twitterfeed

Event: Planning Grant: Security and Software Engineering Research Center (S2ERC) Showcase: May 5 2010 8:00AM to M... http://bit.ly/ayeKB1
2:42 AM May 3rd via twitterfeed

AURA and 2 others

National Science Foundation
@NSF - Jan 28
Social media to track disease!
#NSFfunded researchers at @ASU are developing a #flu-tracking system using @Twitter data along with mathematical equations to offer real-time results on flu spread.

Twitter leading to new way of tracking and predicting virus outbreaks. Algorithm will give daily, localized updates about spread of flu @nsf.gov

Rika Anderson @RikaAnderson - Jan 27
CHECK OUT THESE VENTS!! ROV Jason has arrived at Piccard, home to the deepest and (in my humble opinion) coolest vents in the world. These guys
OLPA REORGANIZED

Amanda Greenwell
Office Head, OLPA

Chief Business Operations
Chief Government Affairs
Chief Public/Media Affairs
Chief Creative Services
History
I am an 

**tech entrepreneur**

I am an NSF story.

**An NSF story starts with you.**

Share your story with #NSFstories
2020 CAMPAIGN

I am a basic science champion.
I am an NSF story.
nsf.gov/NSFstories
#NSFstories

I am a black hole buff.
I am an NSF story.
nsf.gov/NSFstories
#NSFstories

I am a Ms. Frizzle fan.
I am an NSF story.
nnf.gov/NSFstories
#NSFstories
I've enjoyed watching this show again sharing my enthusiasm for science with my own children 🦖

#NSFStories: What a magic school bus can teach us about science education

#NSFStories: Science education and a magic school bus
NSF's approach to funding innovative children's programs
beta.nsf.gov
TOP 10 INSTAGRAM ACCOUNTS IN FEDERAL GOVERNMENT
Instagram Q&A

Instagram Q&A with Kakani Katija, a bioengineer from the Monterey Bay Aquarium Research Institute

Ask Kakani

Type something...

Kakani Katija, Principal Engineer at @MBARI_NEWS

What's your favorite part of your job?

Kakani builds underwater imaging technology that helps us study the weird and wonderful invertebrates in the ocean.
SCIENTIST SELFIES

Mara Menahan
Science Technician, Summit Station

Dr. Hendratta Ali
Associate Professor of Geosciences, Geology - Fort Hays State University

Joseph Wartman
Director, Natural Hazards Reconnaissance Facility (RAPID)
5 NSF-supported STEM education resources that are perfect for virtual learning

September 9, 2020

For many parents, teachers and students, back-to-school routines look a little different this year. Whether you’re a teacher searching for lesson-planning content or a parent looking for activities to... Read More
COVID-19 RESPONSE FUNDING UPDATE
June 19-25, 2020
CASE STUDY NSF DKIST

Facebook LIVE from Daniel K. Inouye Solar Telescope
Friday, February 21 | 12:15 p.m. Eastern

The Sun's Churning Face
A telescope in Hawaii has captured the most-detailed view yet, revealing sunspots the size of Texas. Page A25.

Congratulations to @DKIST and @NSF on producing the highest-resolution photo of the sun ever taken! #technology #science

This is the highest-resolution photo of the sun ever taken. You can see structures on the surface as small as 18.5 miles in size.

technologyreview.com
The sun looks like someone dumped a bunch of Cracker Jacks on a table and took a close-up pic of them. Am I the only one seeing this?
IT'S INTENTIONAL
Session 5: The Future of NSF

NSF Strategic Plan

Sylvia James
Deputy Assistant Director
EHR

National Science Foundation
2022-2026
NSF STRATEGIC PLAN
2022-2026
NSF STRATEGIC PLAN

High-level strategic plan

Identifies broad, long-term objectives and values that help NSF achieve its mission

Not like a university strategic plan

OMB provides guidance on structure

Timeline
• Draft Plan to OMB June 4, 2021
• Final Publication February 2022
2022-2026
NSF STRATEGIC PLAN

Please review current plan (2018-2022)
- available at https://www.nsf.gov/od/oia/strategicplan/feedback.jsp

Comment on key elements of current plan
• Vision
• Core Values
• Strategic Goals
• Strategic Objectives

Provide feedback at:
https://www.nsf.gov/od/oia/strategicplan/feedback.jsp

AC white-paper? Please send to:
StrategicPlan@nsf.gov
2022-2026
NSF STRATEGIC PLAN

High-level questions

1. What are the interests, values and emergent science and policy issues that the Strategic Plan should recognize?
2. How can NSF help maintain US leadership in an evolving global research and education landscape?
3. How can the plan best underscore the importance to the Nation of fundamental research and its broader impacts?
4. What elements of the current Plan, if any, are no longer relevant?
Prepare to meet NSF Director, Dr. Sethuraman "Panch" Panchanathan and Chief Operating Officer, Dr. F. Fleming Crim

Moderator:
Marilyn Strutchens,
Chair, EHR Advisory Committee
Break
3:45 – 4:00 PM
Talk with NSF Director, Dr. Sethuraman "Panch" Panchanathan and Chief Operating Officer, Dr. F. Fleming Crim
Closing Remarks

Karen Marrongelle
Assistant Director, EHR

Marilyn Strutchens,
Chair, EHR Advisory Committee
Dr. Rory Cooper
EHR Advisory Committee Member

National Science Foundation
Dr. Catherine Casserly
EHR Advisory Committee Member