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EHR ADVISORY COMMITTEE MEETING October 29, 2019

Francisco Rodriguez

EHR AC Chair

Chancellor
L.A. Community College District

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EHR ADVISORY COMMITTEE MEETING October 29, 2019

Karen Marrongelle

Assistant Director
Education and Human Resources

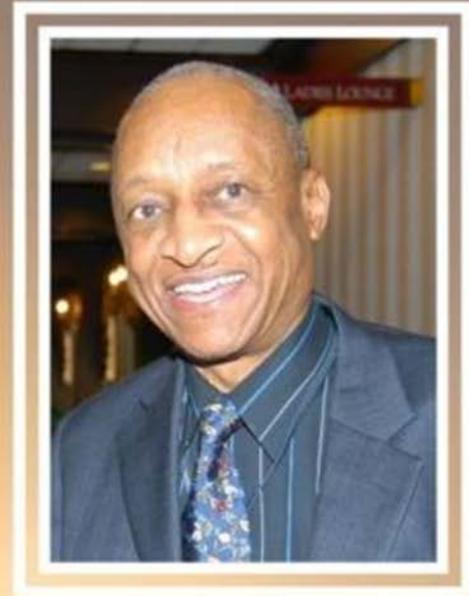
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Please join us in a
memorial service for
Dr. Tyrone Mitchell.

Friday, July 19, 2019
1-3 pm
Room C2010



We will open up the floor for "reflections" for those who would like to say
something or tell your favorite "Ty" story.
His family will also be in attendance.



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EXECUTIVE OFFICE OF THE PRESIDENT
WASHINGTON, D.C.



August 30, 2019

M-19-25

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: RUSSELL T. VOUGHT 
ACTING DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

DR. KELVIN K. DROEGEMEIER 
DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

SUBJECT: Fiscal Year 2021 Administration Research and Development Budget Priorities

- Build and leverage a Diverse, Highly Skilled American Workforce
- Create and Support Research Environments that Reflect American Values
- Build, Strengthen, and Expand Strategic Multisector Partnerships

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On the Hill



House Science Committee Roundtable on Rural
STEM education



Subcommittee on Commerce, Justice, Science and
Related Agencies Committee on Appropriations

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EHR Highlights



An ill wind: Scientists say air carrying plastic bits to Arctic

The changing career trajectories of new parents in STEM

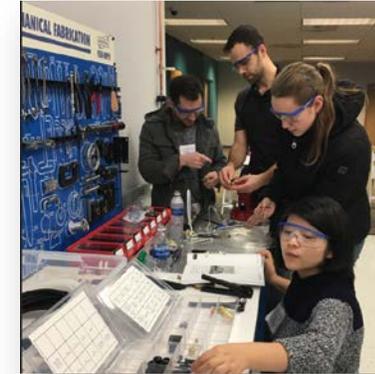
Erin A. Cech and Mary Blair-Loy

PNAS March 5, 2019 116 (10) 4182-4187; first published February 19, 2019
<https://doi.org/10.1073/pnas.1810862116>

Edited by Paula England, New York University, New York, NY, and approved January 3, 2019 (received for review July 9, 2018)




Northwest Passage Project – Student participants alongside researchers found microplastics in Arctic snow



ATE Industry Association (SEMI) Partnership



NSF INCLUDES National Network Alliance

Ongoing Assessment Project (OGAP) Improves Student Learning

New Study Shows Significant Impacts of OGAP on both Teacher Knowledge and Student Performance



NSF/Boeing Partnership to improve online learning for today's workforce

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New Funding Opportunities

- National Artificial Intelligence (AI) Research Institutes – *NSF 20-503*
- NSF RFI on Data Cyberinfrastructure for Future Data-Intensive S&E Research – *NSF 20-015*
- NSF INCLUDES Planning Grants – *NSF 19-600*
- EHR Core Research (ECR): Building Capacity in STEM Education Research – *NSF 19-565*

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Session 1: Federal STEM Education 5-Year Strategic Plan's Annual Progress Report

Moderator: Karen Marrongelle,
Assistant Director, EHR

Presentation: Cindy Hasselbring, Senior Policy
Advisor, Assistant Director, STEM Education, Office
of Science and Technology Policy



Charting a Course for Success: America's Strategy For STEM Education

December 4, 2018

Karen Marrongelle
Assistant Director, Education and Human Resources

National Science Foundation
EHR Advisory Committee

STEM Education Strategic
Plan Implementation Update

October 29, 2019





Charting a Course for Success: America's Strategy For STEM Education

Released December 4, 2018

*All Americans
will have lifelong access to
high-quality STEM education and the
United States will be the global leader in STEM
literacy, innovation, and employment.*

Vision

Build Strong Foundations for STEM Literacy

Increase Diversity, Equity, and Inclusion in STEM

Prepare the STEM Workforce for the Future

Goals

Develop and
Enrich
Strategic
Partnerships

Engage
Students
where
Disciplines
Converge

Build
Computational
Literacy

Operate with
Transparency
and
Accountability

Pathways



Agency Participation

Pathways	Objectives	DOC	DoD	DOE	DOI	DOL	DOS	DOT	ED	EPA	HHS	NASA	NSF	SI	USDA
Develop and Enrich Strategic Partnerships	Foster STEM Ecosystems that Unite Communities	•	•	•	•		•	•	•	•	•	•	•	•	•
	Increase Work-Based Learning and Training through Educator-Employer Partnerships	•	•	•	•	•		•	•	•	•	•	•	•	•
	Blend Successful Practices from Across the Learning Landscape	•	•	•			•	•	•				•	•	•
Engage Students where Disciplines Converge	Advance Innovation and Entrepreneurship Education	•	•	•			•	•	•	•	•		•		•
	Make Mathematics a Magnet	•	•	•					•				•		•
	Encourage Transdisciplinary Learning	•	•	•	•			•	•	•	•	•	•	•	•
Build Computational Literacy	Promote Digital Literacy and Cyber Safety	•	•				•		•		•		•		•
	Make Computational Thinking An Integral Element of All Education	•	•	•	•				•		•		•	•	•
	Expand Digital Platforms for Teaching and Learning	•		•					•				•	•	•



Interagency Working Groups (IWGs) Structure

- **Strategic Partnerships (11 departments/agencies)**
 - Co-chairs: Julie Carruthers, Dept. of Energy, Albert Palacios, Dept. of Ed
- **Convergence (8 departments/agencies)**
 - Co-chairs: Louie Lopez, Dept. of Defense, Sarah Harris, Jorge Valdes USPTO
- **Computational Literacy (9 departments/agencies)**
 - Co-chairs: Jagadeesh Pamulapati, Dept. of Defense, Davina Pruitt-Mentle, NIST
- **Transparency & Accountability (11 departments/agencies)**
 - Co-chairs: Sarah-Kay McDonald, NSF, Christina Chhin, Dept. of Ed
- **Inclusion in STEM (18 departments/agencies)**
 - Co-chairs: Sylvia James, NSF, Eleanor Snow, USGS



Federal Implementation Progress

- Key actions have been identified by agencies to better align their STEM programs to the goals of the Strategic Plan.
- Interagency working groups have developed work plans focused on objectives, actions, and deliverables over the next three years. They will provide regular updates on their progress to FC-STEM.
- FC-STEM action items
 - Increase use of flexible hiring authorities
 - Develop a single, searchable, user-friendly online STEM education resource
 - Collect an annual inventory of STEM programs and a summary of actions undertaken to achieve progress toward the goals presented in the STEM education strategic plan.



Serving as a “North Star” for the STEM Community

- National Council of Teachers of Mathematics – referencing STEM plan in upcoming book on catalyzing change in middle school math.
- National Science Teaching Association – included profile of STEM plan in national conference sessions, panels, and keynotes.
- American Association of Physics Teachers – has included the STEM plan link in member newsletters.
- The Tiger Woods Foundation is aligning their investment portfolio to the STEM plan.
- Several states are promoting the STEM plan to their networks – Arkansas, Iowa, Louisiana, Michigan, North Dakota, Virginia, and Wisconsin
- Council of State Science Supervisors and Association of State Supervisors of Mathematics have included STEM plan at convenings and keynotes.



Aligning to Administration Commitments

- The **Presidential Cybersecurity Education Award** will be presented for the first time in the spring 2020 to recognize great teachers in this fast growing STEM field.
- **\$123 million** was awarded in September 2019 to 41 school districts, nonprofits, and state educational agencies encouraging grantees to “Rethink Education,” 85% of funding focused on **STEM** or specifically on **computer science**.
- Through the President’s newly established, **National Council for the American Worker**, more than 300 companies and organizations have pledged to expand programs that educate, train, and reskill American workers from high school age to near retirement.
- President Trump signed the reauthorization of the **Carl D. Perkins Career and Technical Education Act** to support career and technical education programs for American students.



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Session 1: FC-STEM IWG Panel

Panelists:

- Karen Keene, Program Director, EHR and Member, **IWG Strategic Partnership**
- Arlene de Strulle, Program Director, EHR and Member, **IWG Computational Literacy**
- Cindy Hasselbring on behalf of the **IWG Convergence**
- Sarah-Kay McDonald, Senior Advisor, EHR and Co-Chair, **IWG Transparency and Accountability**
- Sylvia James, Deputy Assistant Director, EHR and Co-Chair, **IWG Inclusion in STEM**

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IWG Strategic Partnerships

Education Pathways for Success

Foster STEM ecosystems that unite communities in workforce development.

Increase work-based learning and training through educator-employer partnerships.

Blend successful practices from across the learning landscape.

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IWG Strategic Partnerships

Building STEM partnerships to maximize impact of
Federal educational efforts

Foster STEM Ecosystems – **Establish additional connections** between Federal STEM professionals and facilities and local/regional STEM ecosystems.

Increase work-based learning (WBL) partnerships – **Expand available paid internships and apprenticeships** w/in Federal agencies and facilities.

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IWG Computational Literacy

Building computational literacy in STEM education to prepare society for the future workforce

Computational Literacy Pathway

- Society has been wholly transformed by digital devices, the internet, and the powerful application of computing—in everyday life and across STEM fields.
- In this increasingly complex technological and computational world, **computational literacy needs to be an integral component of STEM education** to prepare youth with computational skills to solve problems, make sense of data and information, and know how to gather and evaluate evidence to make decisions.

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IWG Computational Literacy

Early IWG Actions will focus on:

Developing consensus on computational literacy components and a common operational definition

- As interpretations of computational literacy may vary with each Federal agency, a common operational definition will be sought through an in-person workshop process, literature reviews, listening forums, and an RFI to discern components of computational literacy, definitions, and promising practices.

Identify Federal and non-Federal programs building computational literacy in STEM education

- Identify best practices, research, curriculum, content, and other measurable quantities that inform successful examples of building computational literacy in STEM education and develop a summary document on the landscape of computational literacy.

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IWG Convergence

Engage students where STEM disciplines converge

- Convergence Pathway** – make STEM learning more meaningful and inspiring to students by focusing on authentic real-world problems and challenges that require initiative and creativity.
- Early IWG actions will focus on **identifying best practices/models in educator upskilling**; soliciting stakeholder inputs on transdisciplinary learning (TD) including innovation and entrepreneurship through forums, convening, and RFIs. Results will inform funding opportunities and synergies for cross-agency collaborations.

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IWG Convergence *(Continued)*

- **Baseline Effective TD Learning** by identifying successful existing model programs that are evidence-based or supported by research in both Federal and non-federally sponsored programs.

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IWG Transparency & Accountability

Measuring and reporting progress, impact, and success

Report Participation Rates of Underrepresented Groups

Recommend (to FC-STEM) **common designations** agencies can use to track and report on underrepresented groups in Federal STEM education programs/investments.

Initial emphases:

- “rural”
- “participant”

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IWG Transparency & Accountability

(continued)

Use Common Metrics to Measure Progress

Present to FC-STEM:

- **Items for inclusion in FY2020 STEM Education Inventory** to elicit agencies' input on feasibility, any anticipated challenges of implementing common metrics for specific sets of STEM education programs, activities, or investments.
- **Recommendations for common metrics agencies can pilot** to track progress towards meeting the goals and objectives of the Strategic Plan.

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IWG Inclusion in STEM

Increase the Diversity of the Federal STEM Workforce

Best Practices for Increasing Diversity and Inclusion (Federal)

- Develop a summary document of evidence-based approaches (best practices, policies) to broadening participation across Federal STEM programs. Share via webinar and make recording widely available.

Collaborate across IWGs to advance key actions on D&I

- Work with T&A IWG on common metrics and language.
- Schedule triannual meetings.
- Develop recommendations with IWGs for key actions that support D&I.
- Gather and publicize baseline data from agencies.

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IWG Inclusion in STEM

(continued)

Increase the diversity of the federal STEM workforce

- Review databases that describe the federal workforce and meet with OPM and others to identify federal diversity issues
- Make recommendations to Co-STEM and FC-STEM on new hiring authority and/or increased flexibilities

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Morning Break
9:45 – 10:00AM

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Session 2: Revisiting EHR's Strategic Re-envisioning Report

Moderator: Sarah-Kay McDonald
Senior Advisor, Office of the
Assistant Director, EHR

Presentation: Karen Marrongelle
Assistant Director, EHR

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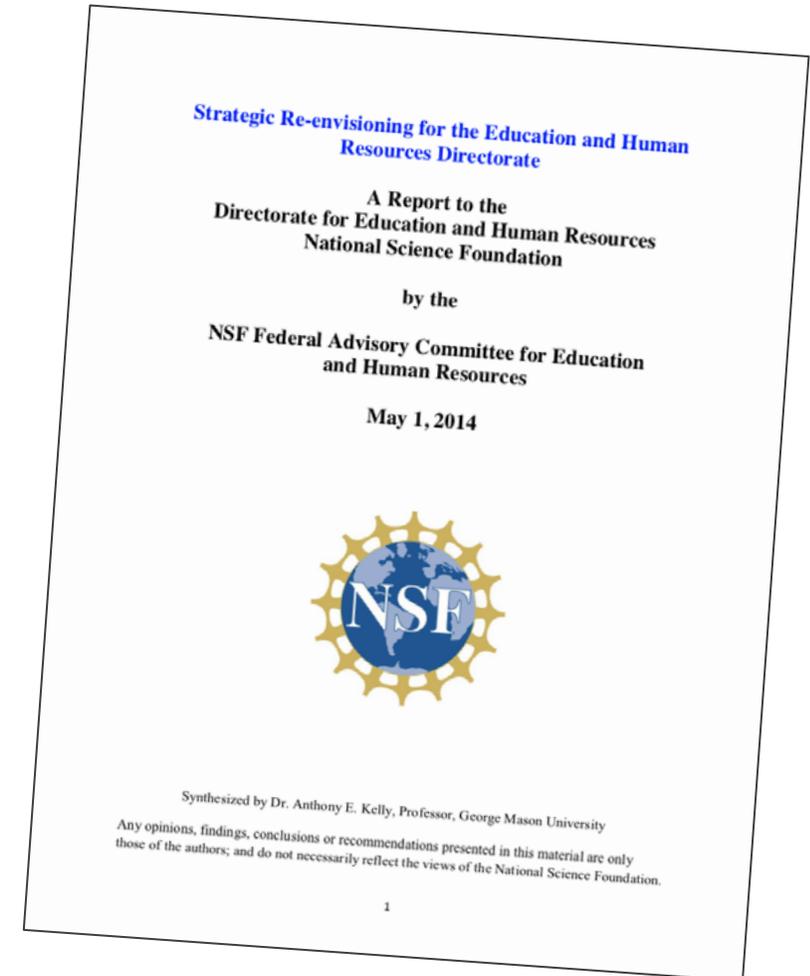
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Revisiting EHR's Strategic Re-envisioning report

In 2013 EHR asked the AC to provide critical input regarding future directions for the Directorate. The AC was asked to

- re-imagine an EHR of the future,
- provide input on a strategic framework for achieving the Directorate's mission, and
- consider three broad themes that provide focus for the Directorate's work.



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Goals for Today's Discussion

- Re-familiarize ourselves with the Re-envisioning Report and its genesis.
- Revisit the recommendations of the May 2014 EHR Re-envisioning Report and discuss:
 - Relevancy of the document for EHR in 2019
 - Any updates that should be made
 - How the AC would like to see reporting of activities related to the recommendations moving forward

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Recommendation: View broadening participation as a solution, not as a problem to be solved

Suggestion	Example(s) of things EHR has done
Explore possibilities for greater and more meaningful participation that arise from building and leveraging partnerships.	EHR's partnership with The Boeing Company resulted in \$1M gift to support students returning to STEM after a break, especially women and women veterans.

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Recommendation: Align investments in PK-16 education with changing STEM workforce needs

Suggestion	Example(s) of things EHR has done
<p>EHR is encouraged to survey and synthesize the current NSF portfolio for programs that could inform workforce needs and training in addition to the Innovative Technology Experiences for Students and Teachers (ITEST) and the Advanced Technological Education (ATE) programs.</p>	<p>EHR is leading an analysis of investments in the skilled technical workforce across NSF. Every Directorate supports projects involving the STW and EHR's investments span beyond the ATE and ITEST programs.</p>

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Recommendation: Capitalize on promising trends in STEM learning

Suggestion	Example(s) of things EHR has done
<p>EHR should continue to exploit the potential of cyberinfrastructure to transform STEM learning within and across the formal and informal education sectors so that all American students can meet and exceed the expectations articulated in education standards and related policy documents.</p>	<p>EHR has leading role in Artificial Intelligence (AI) Research Institutes: AI-Augmented Learning theme – foundational and use-inspired research to actively build the next generation of talent.</p>

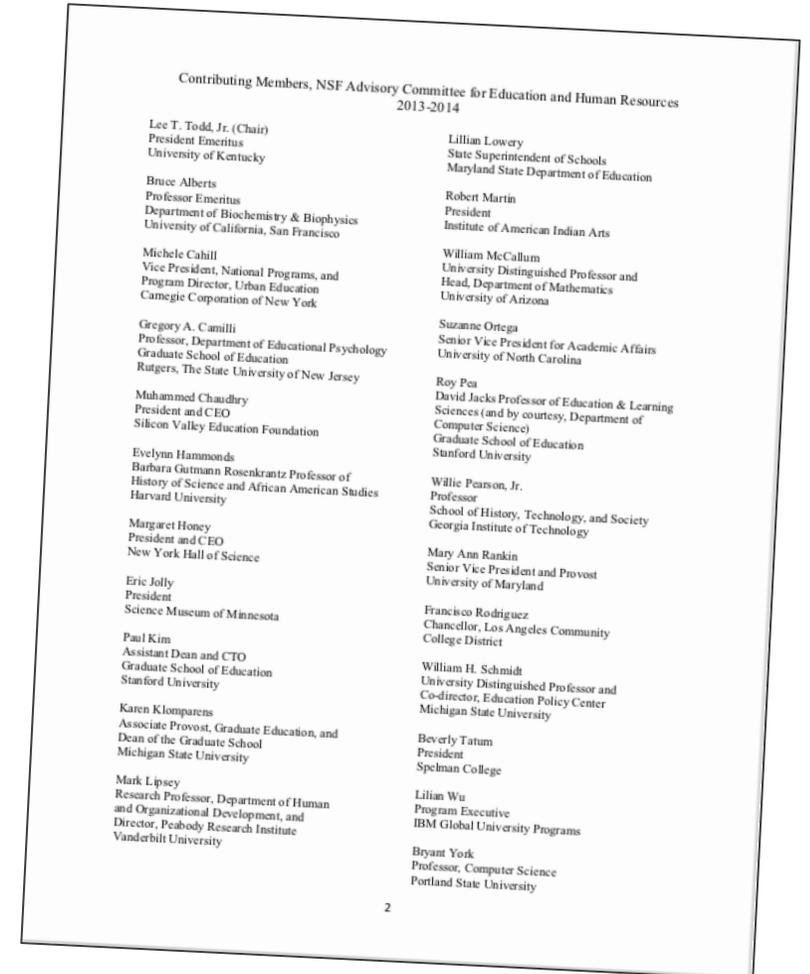
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Today's panel of AC members who contributed to the original report

- **Muhammed Chaudhry**, Former CEO, Silicon Valley Education Foundation
- **Margaret Honey**, President and CEO, New York Hall of Science
- **Francisco C. Rodriguez**, Chancellor, Los Angeles Community College District
- **Lillian Wu**, Program Executive, Global University Programs, IBM Corporation



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Insights from the AC

- What was the original vision for how the plan should guide EHR's work, over what time frame?

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Insights from the AC

- What was the original vision for how the plan should guide EHR's work, over what time frame?
- From members' perspectives, where has EHR made (is EHR making) meaningful progress towards meeting the goals set-out in the plan?

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Insights from the AC

- What was the original vision for how the plan should guide EHR's work, over what time frame?
- From members' perspectives, where has EHR made (is EHR making) meaningful progress towards meeting the goals set-out in the plan?
- Which elements of the plan (e.g., recommendations) are particularly relevant to guide EHR's work moving forward?

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Insights from the AC

- What was the original vision for how the plan should guide EHR's work, over what time frame?
- From members' perspectives, where has EHR made (is EHR making) meaningful progress towards meeting the goals set-out in the plan?
- Which elements of the plan (e.g., recommendations) are particularly relevant to guide EHR's work moving forward?
- Does anything in the plan need to be refreshed, or is anything 'missing'?

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Session 3: Discussion on Big Ideas: Midscale

Moderators/Presentation:

- Steve Turley, Program Director, Division of Research on Learning in Formal and Informal Settings, EHR
- John Cherniavsky, Senior Advisor, Division of Research on Learning in Formal and Informal Settings, EHR, and
- Lee Zia, Deputy Division Director, Division of Undergraduate Education, EHR

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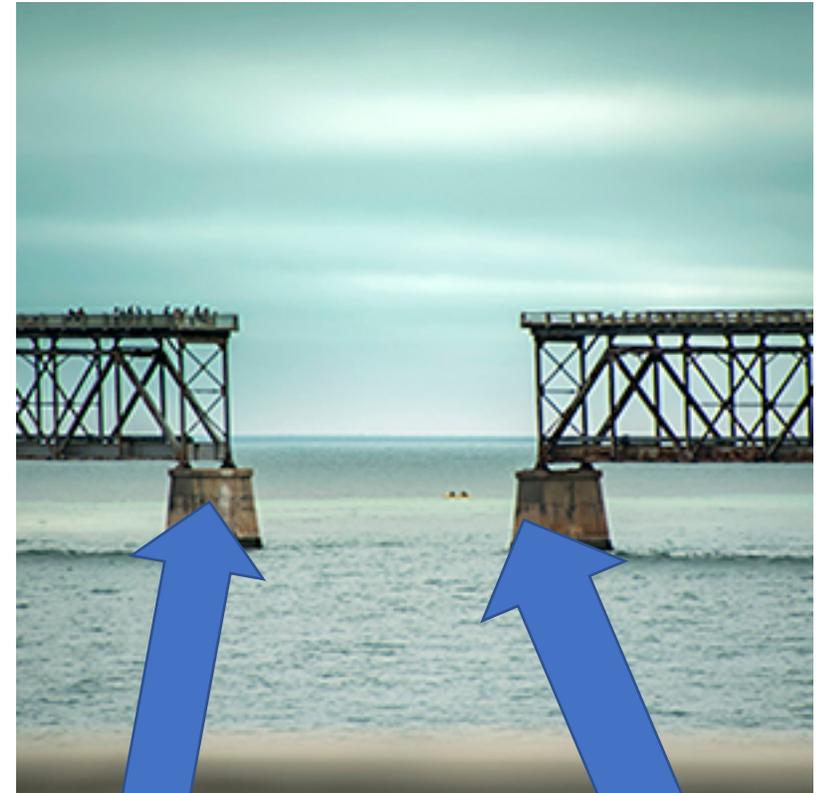


NSF Mid-scale Big Idea

Purpose: address gap between funding for small experiments and major facilities

Solicitations for two ranges of proposals

- Midscale RI-1: \$6M to \$20M
- Midscale RI-2: \$20M to \$70M



\$6M

\$70M

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Major Research Instrumentation (MRI)

- Instrumentation in the \$100k to \$4M range
- Acquisition and development of instrumentation for research and research training
- Multi-user
- 30% cost sharing required for PhD-granting institutions
- Not for buildings or renovations
- No EHR Awards (other than workshops) since FY 2010

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Midscale RI-1

- Solicitation NSF 19-357
- Solicited both design and implementation proposals
- Ten Awards were made
 - EHR Community Actively Invited to Participate
 - 10 Awards (3 Design and 7 Implementation)
 - Focused on Instrumentation
 - Awards made in GEO, CISE, MPS, and BIO directorates

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Example RI-1 Awards

- 1.2 GHz NMR Spectrometer (BIO)
 - None in U.S. at present
 - Expands materials which can be studied
- Next generation event horizon telescope (MPS)
 - Expand number of telescopes
 - Increases speed, range, and fidelity
- Atmospheric research aircraft (GEO)
 - Modernize aging aircraft
 - Critical for advancing study of weather, climate, air quality, and wildfire predictions

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Midscale RI-2

- Solicitation NSF 19-542
- Invited full proposals due last August
- Awards anticipated in FY 2020

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Characteristics of Mid-scale Projects

What They Are

- Design projects
- Acquisition or construction
- New or updated infrastructure
- Identified community need
- Strong technical and management expertise
- High states of readiness

What They Are Not

- Buildings
- Centers
- Local Improvements
- Research Projects
- Operations and maintenance

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Challenges

- Preparing community to think in terms of mid-scale infrastructure
- Developing and demonstrating the expertise to manage a project of this scale
- Articulating a community plan with prioritized infrastructure objectives
- Explaining EHR-appropriate infrastructure to STEM colleagues who are used to thinking in terms of hardware instrumentation

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Promotion in EHR Community

- Convene workshop to identify community needs
- Host PI webinar
- Publicize opportunity in professional association newsletters
- Other ideas?

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Big Questions

- Broad and long-term effectiveness of various STEM educational policies and interventions
- Relationships among various factors affecting learning environments
- Differential results for small groups
- Persistent insights from different approaches and environments
- Others?

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What Might EHR Infrastructure Look Like?

- Highly instrumented learning environments
- Integrated data environments
 - Longitudinal data
 - Horizontal data (wide-ranging characteristics)
 - Addressing privacy issues
- DOE investments typically don't focus on STEM
- Other ideas?

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Lunch Break
11:30 – 12:30PM

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Session 4: STEM Education of the Future Subcommittee of the EHR Advisory Committee

Moderator: Robin Wright, Division Director,
Division of Undergraduate Education, EHR

Presentation: Margaret Honey
AC Subcommittee Chair

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A Vision for STEM Education of the Future

Subcommittee Members: Dr. Margaret Honey (chair), Dr. Bruce Alberts, Dr. Hyman Bass, Dr. Carlos Castillo, Dr. Okhee Lee, Dr. Francisco Rodriguez (ex-officio member), Dr. Marilyn M. Strutchens, Dr. Laurel Vermillion, Dr. Robin Wright (Division Director, Undergraduate Education)

Executive Secretary: Dr. Alexandra Medina-Borja (EHR/DUE)



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Vision

STEM education of the future provides equitable access to all learners, applies evidence of how people learn across the lifespan, provides personalized experiences that illuminate STEM concepts, embraces and foresees rapid technological change, and is anchored in the confidence that all citizens can fully contribute to our nation's progress.

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NSF's 10 Big Ideas and what comes next will serve as an important roadmap

- INCLUDES
- Future of Work at the Human-Technology Frontier
- Convergence Research
- Harnessing the Data Revolution

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Characteristics of Effective STEM Learning Environments

1. STEM learning environments that are project-based, student-centered, and personalized.
2. Educational systems and interventions that are intentionally designed with consideration of equity and inclusion of all learners across the lifespan.
3. Technologies that are both aids for inclusion of all learners and subjects to be learned.

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Questions

- Do you think this vision is going to be current for the future of education in 20-30 years?
- Is there anything important missing from this vision?
- Is there anything that should be removed from this vision?
- The idea that at every step we need to design materials, courses, classrooms and pedagogies with equity in mind is central to the vision. How could NSF/EHR implement this vision of having access and inclusion as the foundation and lens through which our STEM educational system is designed?

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Session 5: EHR Response To Graduate Education AC Subcommittee Report

Moderator/Presentation:

Nirmala Kannankutty, Acting Division Director,
Division of Graduate Education, EHR

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Graduate STEM Education for the 21st Century: Next Steps for NSF

Nimmi Kannankutty
Division of Graduate Education
Division Director (Acting)
October 29, 2019

National Science Foundation



NASEM Report Outcome and Features

Rationale

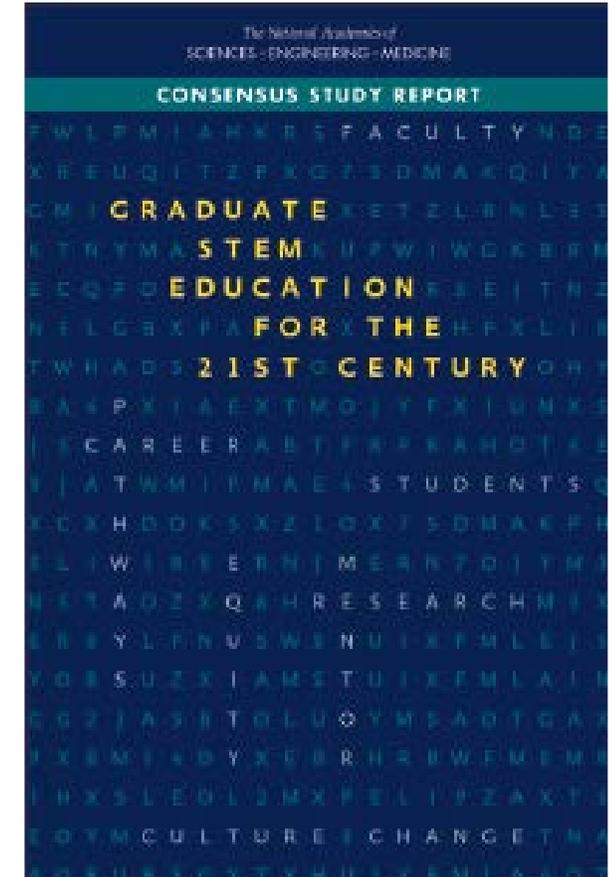
- 20 years since the prior consensus study had been conducted
- Persistent concerns about graduate education; DGE wanted to ensure options for impactful change

Outcomes

- Affirmation of the strength of US STEM graduate education - “gold standard”
- Adaptation needed to address emerging needs

Features

- Statement of themes for improving STEM graduate education
- Features of an “ideal” STEM graduate education
- Key recommendations by stakeholder group (e.g. funding agencies; private foundations and nongovernmental organizations; IHEs, graduate schools, departments and programs; faculty members; professional societies; employers; and graduate students)



The National Academies of Sciences, Engineering and Medicine. 2018

National Science Foundation

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Responding to the Recommendations for Federal/State Funding Agencies

1. External Advice
Subcommittee of the EHR Advisory Committee
 - *Community and disciplinary input*
2. Internal Advice
NSF Program Officer Working Group
 - *Programmatic perspectives from across NSF*
3. Expert Advice
Division of Graduate Education
 - *Portfolio assessment and graduate education expertise*

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Report Recommendations for Federal/State Funding Agencies

1. Support **research** on the **graduate education system**, interventions and policies, and outcomes of funding mechanisms
2. Support **research** on **adapting the graduate education enterprise** to the changing nature of science
3. Require **data collection** on graduate students (long-term outcomes); provide this **data in proposals** for traineeships, fellowships, research assistantships
4. **Align policies and award criteria** to ensure an “Ideal” graduate education
5. **Incentivize diversity**, equity and inclusion metrics in funding criteria; **include accountability** in reporting mechanisms
6. Require Individual Development Plans (**IDPs**) for graduate students; update annually

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Input to EHR on Recommendations

Recommendation	EHR AC Subcommittee	NSF Program Officers
Support Research on Graduate Education	<ul style="list-style-type: none">• Provided some guidance on how to support research efforts	<ul style="list-style-type: none">• Provided some guidance on partnering
Require Data Collection/Include in Proposals	<ul style="list-style-type: none">• Desirable goal• Challenges include creating standards and mandates without funding that could impact quality	<ul style="list-style-type: none">• Highly desirable goal• Consider existing data• Encourage consistency and standards• Disseminate data if possible
Align Policies and Award Criteria to Ideal Grad Ed	<ul style="list-style-type: none">• Endorse competencies in report• How to support them?• Do not tie funding decisions to competencies until they are validated	<ul style="list-style-type: none">• Use NRT as a model of good practice• Consider capability of institutions to carry out this recommendation

Input to EHR on Recommendations (2)



Recommendation	EHR AC Subcommittee	NSF Program Officers
Incentivize Diversity/Include Accountability	<ul style="list-style-type: none">• Recommend improved merit review criteria on broadening participation (BP) in Broader Impacts• Make BP an explicit criteria in some programs	<ul style="list-style-type: none">• Challenges with obtaining metrics at the proposal stage• BP should go beyond demographics• Provide examples of best practice
Require IDPs	<ul style="list-style-type: none">• Provided options to support the recommendation• Provided proposal and reporting requirements	<ul style="list-style-type: none">• Communicate NSF's recognition of the importance of good mentoring/professional development for graduate students• Support research/pilot studies on IDP best practices

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DGE Response Framework

1. Research

How can we employ research programs to better understand the graduate education enterprise?

2. Programs

How can we update our research and training programs to modernize graduate education?

3. Policies

What policy changes can the division or agency employ to: a) better understand the institutional interventions and students that are funded; and b) to support institutional changes in support of graduate education modernization?

4. Outreach and Coordination

How can the division or agency improve our outreach and coordination activities with other stakeholders in the graduate education enterprise?

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DGE Strategy

Framework Element	Strategy - Examples
Research	<ul style="list-style-type: none">• Research on best practices for data collection, interventions• Collaborate and partner with other stakeholders to enhance research efforts• Support more pilots or “proof of concept” activities• Update current funding opportunities to encourage more model development• Consider a knowledge hub/center• Promote large-scale institutional change
Programs	<ul style="list-style-type: none">• Expand and partner on data transparency efforts• Focus on implementation and assessment of training models for graduate education

DGE Strategy (2)

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Framework Element	Strategy - Examples
Policies	<ul style="list-style-type: none">• Provide guidance on any standardization of data/reporting requirements that are developed• Ensure alignment with institutional policies for funding mechanisms• Emphasize NSF's expectations on mentoring within a program's scope• Improve approach to monitoring diversity/inclusion/equity• Foster cross-directorate discussions on disciplinary needs
Outreach/Coordination	<ul style="list-style-type: none">• Highlight existing data resources on graduate education• Disseminate research findings• Encourage development of a resource network• Support community-driven efforts• Use data-driven approaches to outreach for programs

Questions for the EHR AC

1. Are there any gaps in our strategies?
2. The AC Subcommittee put an emphasis on expanding and updating DGE's research programs, and disseminating the research results. The latter will be a high priority. We would welcome your input on these activities.
3. Are there any other activities that we should consider in response to the NASEM report?



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**Prepare to Meet
Dr. F. Fleming Crim
Chief Operating Officer, NSF**

Moderator:
Francisco Rodriguez
EHR AC Chair

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**Talk with
Dr. F. Fleming Crim
Chief Operating Officer, NSF**



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Afternoon Break

3:00 – 3:15PM

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Session 6: Public Private Partnership (PPP) Subcommittee of the EHR Advisory Committee

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

Presentation: David Monk, AC Subcommittee Chair
Remarks: Karen Marrongelle, Assistant Director, EHR

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Update: EHR AC Subcommittee on Public-Private Partnerships (PPP)

David Monk, EHR AC PPP Subcommittee Chair, and
Professor, College of Education, Penn State University

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Membership of the EHR AC Subcommittee on Public-Private Partnership

Chair (current): **Dr. David Monk**, Professor, *College of Education, Pennsylvania State University*

Chair (initial): **Dr. Liz Boylan**, Program Director, *Alfred P. Sloan Foundation's programs on STEM Higher Education*

Subcommittee members throughout the life of the subcommittee:

Ex Officio: **Dr. Francisco Rodriguez**, EHR AC Chair, and *Chancellor, Los Angeles Community College District*

Dr. John T. Bruer, *President Emeritus, James S. McDonnell Foundation*

Mr. Muhammed Chaudhry, *President and CEO, Silicon Valley Education Foundation*

Dr. Roy Pea, *Professor, Professor of Education and Learning Sciences, Stanford University*

Dr. Debra Joy Pérez, *Chief Measurement Evaluation and Learning Officer, Gordon and Betty Moore Foundation*

Dr. Jim Spillane, *Professor, Human Development & Social Policy, Northwestern University*

Dr. Lilian Wu, *Program Executive, Global University Programs, IBM Corporation*

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The PPP subcommittee was charged with

- (1) recommending strategies to EHR for building strong public-private partnerships,
- (2) providing EHR guidance for decision-making, monitoring, and impact of public-private partnerships, and
- (3) characterizing EHR's potential role in public-private partnerships.

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Draft Recommendations (1)

- Consider how partnerships may alter how EHR envisions itself and operates in advancing NSF and EHR's mission.
- Determine specific priorities areas for partnerships.
- Identify or hire staff (or consultants) with expertise in identifying, building, and maintaining public-private partnerships.
- Ensure program staff have sufficient time to invest in partnerships.

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Draft Recommendations (2)

- Communicate priorities and processes to help potential partners navigate relationship-building with EHR.
- Consider the range of benefits, beyond additional funding, from public-private partnerships.
- Develop explicit criteria for what counts as success in partnerships.
- Look beyond the most obvious partners. Consider partnering with industry, venture capital, small and large philanthropic organizations, and those not directly involved in education.

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EHR Partnerships

- Observations
- Developing Vision



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Questions for Discussion

1. What key recommendations for EHR are missing at this point?
2. What counts as success in partnerships? What specific criteria would you recommend:
 - at the level of the EHR portfolio of partnerships?
 - for each individual partnership in EHR?
3. How might EHR want to change as an organization to best leverage partnerships to achieve EHR's mission?
4. How might EHR AC members serve to bridge cultures between NSF and its partners? How else may EHR AC member be able to contribute to EHR partnerships?

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Session 7: Update from Committee on Equal Opportunities in Science and Engineering (CEOSE)

Moderator: Jermelina Tupas, Acting Division
Director, Division of Human Resource Development,
EHR

Update: Kaye Husbands Fealing
Member, CEOSE

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CEOSE

THE COMMITTEE ON EQUAL
OPPORTUNITIES IN SCIENCE
AND ENGINEERING



BIENNIAL REPORT TO CONGRESS 2017-2018
INVESTING IN DIVERSE COMMUNITY VOICES

Investing in Diverse Community Voices

Committee on
Equal Opportunities in
Science and Engineering
(CEOSE)

Biennial Report to Congress 2017-2018
September 2019

Kaye Husbands Fealing
Georgia Tech

Directorate for
Education and Human Resources
Advisory Committee Meeting
October 29, 2019

NSF Investment in Broadening Participation (BP)

- ◇ BP is articulated as **core value in NSF's strategic plan** for 2018-2022, and as a strategic objective:
 - ◇ “foster the growth of a more capable and diverse research workforce and advance the scientific and innovation skills of the Nation.”
- ◇ NSF spent slightly over **\$1 billion** in broadening participation programs and activities in FY 2018.
- ◇ NSF's increased commitment to BP is demonstrated through **The Big Idea, NSF INCLUDES** (Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science).

CEOSE's Mission and Background

- ◆ Congressionally-mandated advisory committee charged to provide advice to NSF regarding the full participation of underrepresented populations in science and engineering
- ◆ Biennial report submitted to the NSF Director who transmit the report to Congress
 - ◆ State of participation of underrepresented groups
 - ◆ Review of NSF's policies and funding opportunities to broaden participation
 - ◆ Summary of CEOSE activities during the two-year reporting period and future plans for the next two years
 - ◆ Recommendations to the National Science Foundation for improving participation levels of underrepresented groups

Elements Included in the 2017-2018 CEOSE Report

- ◆ BP examples throughout the report
- ◆ Trend data about broadening participation and the merit review process (Appendix A)
- ◆ NSF INCLUDES Awards Directory, FY 2016-2018 (Appendix B)
- ◆ Information on HSI Program Awarded Projects FY 2018 (Appendix C)
- ◆ HBCU Excellence in Research (EiR) Awards Directory (Appendix D)
- ◆ Overview of the 2015-2016 CEOSE Report (Appendix E)
- ◆ Examples of NSF-Supported Strategies/Activities/Projects Related to CEOSE's Suggested Practices for NSF's Role in Ensuring Accountability (Appendix F)
- CEOSE has prepared a dissemination letter and flyer that will be sent to the leadership of over 100 STEM organization, NSF Program Directors, members of the various NSF Advisory Committees, and other listservs.

CEOSE's Recommendation to NSF

**Give *increased* attention to
including diverse community voices
across its research and education portfolios
through community-driven projects.**

This call to action includes the development and use of **frameworks**, **methodologies**, **datasets**, and effective **communication of ideas** to be informed by stakeholder and public communities.

Suggested Action to be Responsive

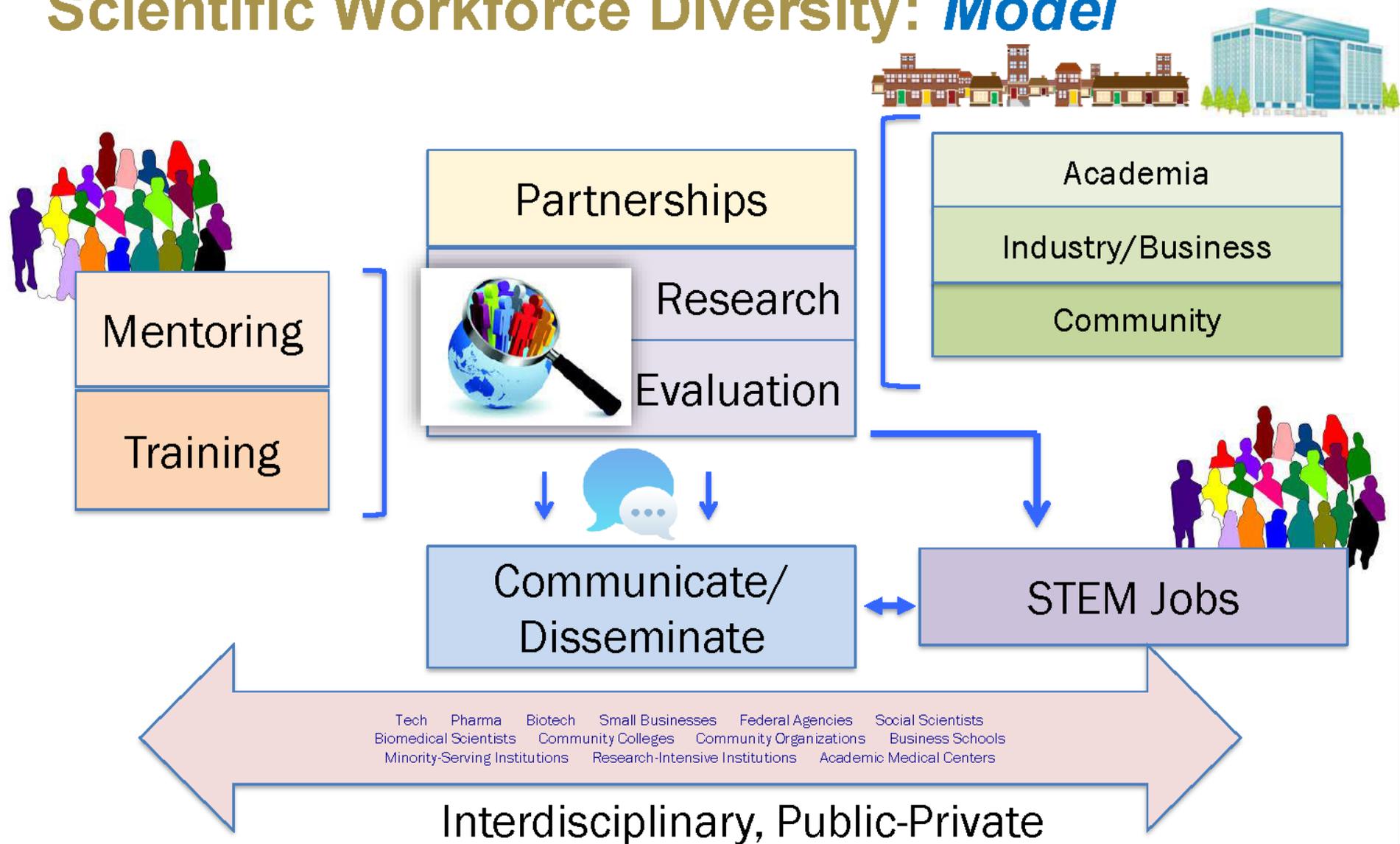
- ◆ CEOSE encourages NSF to continue to provide leadership in increasing the participation of underrepresented groups in the STEM enterprise by **partnering** with other federal agencies, education institutions, STEM professional associations/societies and others, including communities and stakeholders who can collaborate in the co-production of knowledge.

Preliminary Topics for Future CEOSE Reports*

- ◇ Pathways for inclusion of **persons with disabilities** in STEM education and the workforce
- ◇ Pathways to **leadership** in STEM fields

* CEOSE to add up to five new members in February 2020

NIH Hubs of Innovation and Research in Scientific Workforce Diversity: *Model*



Thank you.

List of CEOSE Members:

Dr. Jose Fuentes, Chair

Dr. Alicia Knoedler, Vice Chair

<https://www.nsf.gov/od/oia/activities/ceose/members.jsp>

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Session 8: Broadening Participation Subcommittee (BPS) of the EHR Advisory Committee

Moderator: Jermelina Tupas, Acting Division
Director, HRD, EHR

Presentation: Debra Joy Perez
AC Subcommittee Chair

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Broadening Participation Subcommittee Overall Charge and Approach

Broad aim is to assess NSF programming impacts on Broadening Participation (BP)

One way of assessing impact is reviewing the value of data currently available then making recommendations for improving data collection related to BP

- Examining the robustness of information available on underrepresented populations applying for funding to NSF and EHR

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Broadening Participation Subcommittee Overall Charge and Approach *(continued)*

- Developing a set of questions to compare underrepresented and non-UR recipients (include subgroup comparisons)
 - What are the common metrics across programs related to BP that may assist in establishing a core set of identifiers?
 - What are the unique metrics for discrete programs that can serve as models for other programs?
 - How frequently and in what format could and should these metrics be collected?

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Lessons Thus Far

Accessing data on BP was complex and difficult

- Differential impacts of programs for UR grantees are difficult to assess unless we have demographic data about applicants
- BP Subcommittee began with a deep exploration of ONE program to identify systemic challenges to understanding the impact of NSF funding on BP
- Examined relationships between CAREER award (or decline) and future publications, citations, and grant awards
- NSF analyst spent significant time in accessing, compiling and analyzing demographic data on applicants

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CAREER Analysis Approach

Using EHR CAREER data, the BP proposes we conduct a deep examination of CAREER recipients (and perhaps declines) to answer the following questions:

1. How do you identify? (Race/ ethnicity, gender, etc.)
2. What is your discipline or field?
3. What is your major research area(s)?

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CAREER Analysis Approach

(continued)

4. Discuss the type of funding that you have had and associated publications.
 5. To what do you attribute your success in receiving funding and success in your field?
 6. What suggestions do you have for NSF for broadening participation?
- The BP committee believes it would be important to include a few cases of people who have been successful with acquiring NSF funding and publishing.

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Questions to EHR Advisory Committee

- What do you think of this approach?
- Are there exemplar programs within NSF that do a good job of identifying and collecting BP measurements?
- Are there other funding agencies that collect detailed BP data from their NON-BP programs that could serve as models?

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Closing Remarks

Karen Marrongelle
Assistant Director, EHR

Francisco Rodriguez
EHR AC Chair

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Departing EHR Advisory Committee Members



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Incoming EHR Advisory Committee Chair



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Closing Remarks

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