



Federal Agency Funding Opportunities Within and Beyond NSF

June 2, 2016

Washington, DC

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Program Director

Division of Research on Learning in Formal and Informal Settings

Directorate for Education and Human Resources

National Science Foundation



Within NSF:

Karen King: ECR, CS for all

Arlene de Strulle: STEM+C

Robert Russell: AISL, ITEST, Cyberlearning



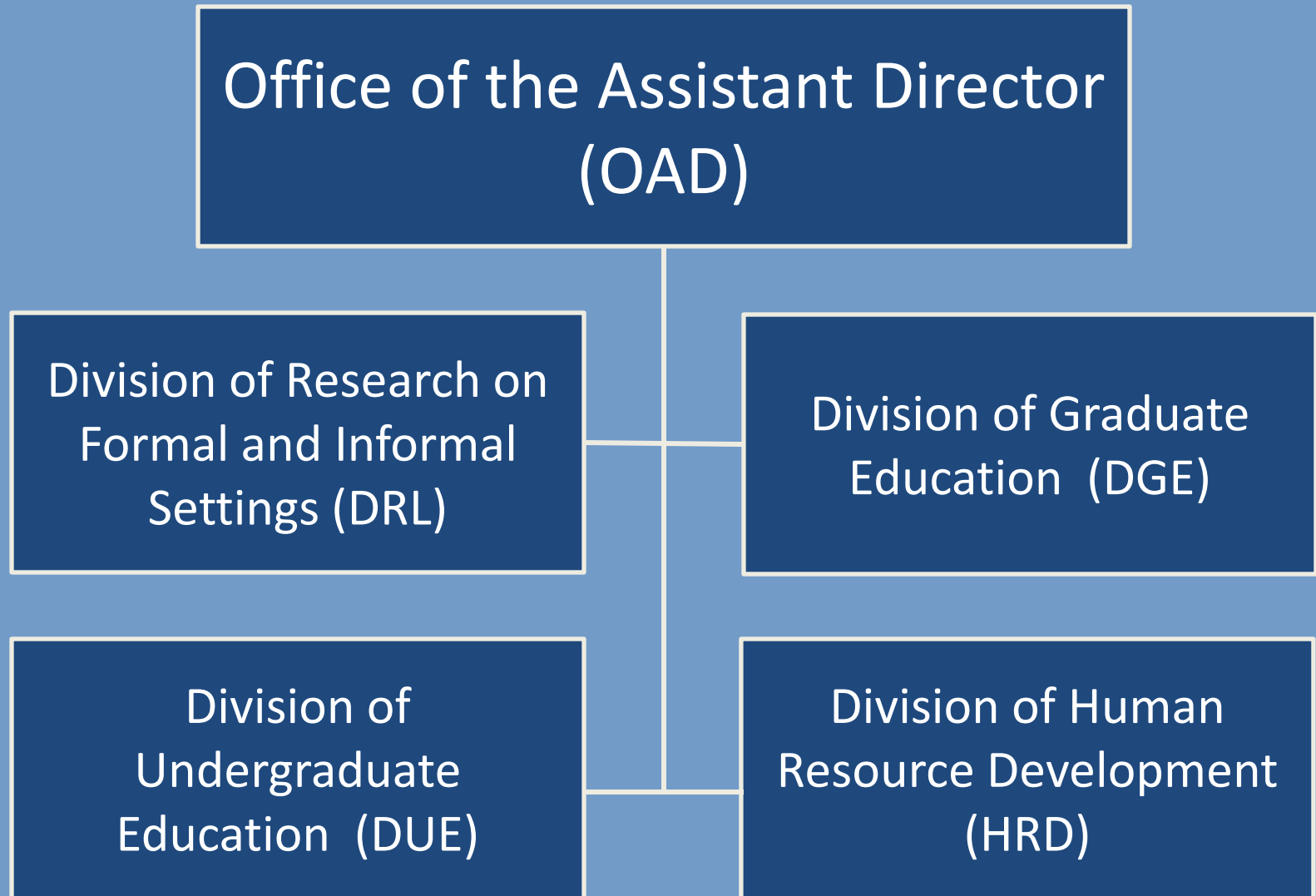
Beyond:

**Elizabeth Albro and Christina Chhin
United States Department of Education**



Tony Beck, National Institutes of Health

EHR's organizational structure



Program Focus in the EHR Directorate

EHR Division	Learning and Learning Environment	Broadening Participation in STEM	STEM Professional Workforce
Research on Learning (DRL)	ECR - <i>Learning</i> DR-K12 AISL ECR + REAL =FY2015	ECR includes: <ul style="list-style-type: none"> • Research on Gender in Science and Engineering (GSE) • Research in Disabilities Education (RDE) 	STEM+C Partnerships for the 21 st Century <i>formerly Math and Science Partnership</i> ITEST - Innovative Technology Experiences for Students and Teachers
Graduate Education (DGE)	Project and Program Evaluation (PPE) Building Community & Capacity in Data (BCC)	ECR- <i>STEM Professional Workforce</i> CyberCorps: Scholarship for Service (SFS) Graduate Research Fellowship (GRF) National Research Traineeship (NRT)	
Human Resource Development (HRD)	ADVANCE AGEP HBCU-UP TCUP	ECR- <i>Broadening Participation and Capacity Building</i> LSAMP	Excellence Awards in Science and Engineering - PAEMST & PAESMEM CREST
Undergraduate Education (DUE)	ECR- <i>Learning Environment</i> Improving Undergraduate STEM Education (IUSE)		Advanced Technological Education (ATE) Robert Noyce Teacher Scholarship Program S-STEM Scholarship Program

EHR Core Research (ECR) across all themes:
EHR invests in foundational research for the
strategic improvement of STEM education.



Program Focus in DRL

EHR Division	Learning and Learning Environment	Broadening Participation in STEM	STEM Professional Workforce
<p>Research on Learning in Formal and Informal Settings (DRL)</p>	<p>Core Research & Development (ECR)</p> <p>DR-K12- (Discovery Research K-12)</p> <p>AISL- Advancing Informal STEM Learning</p>	<p>ECR* includes:</p> <ul style="list-style-type: none"> • Research on Gender in Science and Engineering (GSE) • Research in Disabilities Education (RDE) <p>*ECR + REAL= FY2015</p>	<p>STEM+C Partnerships for the 21st Century <i>formerly Math and Science Partnership</i></p> <p>ITEST - Innovative Technology Experiences for Students and Teachers</p>

Program Focus in DGE

EHR Division	Learning and Learning Environment	Broadening Participation in STEM	STEM Professional Workforce
Graduate Education (DGE)	Project and Program Evaluation (PPE)/Promoting Research and Innovation in Methodologies for Evaluation (PRIME)	<ul style="list-style-type: none">• EHR Core Research: Workforce Development (ECR)*• SFS- CyberCorps: Scholarship for Service• GRF - Graduate Research Fellowship• NRT- National Research Traineeship• INSPIRE-Integrated NSF Support Promoting Interdisciplinary Research and Education• NSF Innovation Corps (I-Corps)	

Program Focus in HRD

EHR Division	Learning and Learning Environment	Broadening Participation in STEM	STEM Professional Workforce
Human Resource Development (HRD)	<ul style="list-style-type: none"> • ADVANCE-Increasing the Participation and Advancement of Women in S & E careers • AGEP-Alliances for Graduate Education and the Professoriate • HBCU-UP-Historically Black Colleges and Universities Undergraduate Program • TCUP- Tribal Colleges and Universities Programs 	<p>*Core Research & Development (ECR)</p> <p>LSAMP- Louis Stokes Alliances for Minority Participation</p>	<ul style="list-style-type: none"> • PAEMST- Presidential Awards for Excellence in Mathematics and Science Teaching • PAESMEM- Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring) • CREST- Centers of Research Excellence in Science and Technology

Program Focus in DUE

EHR Division	Learning and Learning Environment	Broadening Participation in STEM	STEM Professional Workforce
Undergraduate Education (DUE)	Core Research & Development (ECR) IUSE- Improving Undergraduate STEM Education		Advanced Technological Education (ATE) Robert Noyce Teacher Scholarship Program (NOYCE) S-STEM = Scholarship in STEM Program



Division of Graduate Education Portfolio

**Graduate Research
Fellowship
Program**

**NSF Research
Traineeship
Program**

**CyberCorps
Scholarship for
Service**

**EHR Core
Research:
Workforce
Development**

**Project and
Program
Evaluation**



Division of Graduate Education Portfolio

**Graduate Research
Fellowship
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**Project and
Program
Evaluation**



STEM + Computing Program STEM+C

- ✓ Integrating Computing in K12 STEM Education
- ✓ Advancing Computer Science in HS
- ✓ Expanding Research on Broadening Participation in Computing

By integrating computing in STEM teaching and learning, the program seeks to:

- Effect the way STEM is taught
- Improve the understanding of STEM through creative scientific exploration made possible by computational approaches
- Expose students to the effectiveness of using computational approaches to solve real world problems in STEM fields
- Prepare teachers to use computational thinking and computational approaches in their practice



Transform the Frontiers

Innovate for Society

Perform as a Model Organization



Proposals should:

- **Emphasize R&D on the integration of computing in one or more STEM disciplines**
- **Have interdisciplinary collaboration with computing**
- **Seek to advance new models for teaching and learning, innovative courses, curriculum, course materials, and R&D on new pedagogical strategies and environments that advance integration of computing in STEM disciplines.**



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Perform as a Model Organization



Examples of research questions:

- ✓ What are the strategies and tools needed for developing computing skills within specific STEM disciplines for teachers and/or students?
- ✓ How might strategies need to be modified for different disciplines?
- ✓ How do students acquire skills in the use of computing methods and computational ways of knowing within a specific K-12 learning environment?
- ✓ What teacher education courses need to be modified or PD offered for preparing teachers to cultivate computing skills?



Transform the Frontiers

Innovate for Society

Perform as a Model Organization



STEM+C FY15

Integration of Environmental Chemistry and Computing to Advance Evidence-based Reasoning, Problem Solving, and Computational Thinking in Middle School Students

Award Number: 1543022

Principal Investigator: Deborah Tatar

Organization: Virginia Polytechnic Institute and State University

Integrating Computational Thinking and Environmental Science: Design Based Research on Using Simulated Ecosystems to Improve Student Understanding of Complex System Behavior

Award Number: 1543144

Principal Investigator: Stephen Uzzo

Organization: New York Hall of Science

Research on Effects of Integrating Computational Science and Model Building in Water Systems Teaching and Learning

Award Number: 1543228

Principal Investigator: John Moore

Organization: Colorado State University

Research on the Development of Computational and Systems Thinking in Middle School Students through Explorations of Complex Earth Systems

Award Number: 1542954

Principal Investigator: Gillian Puttick

Organization: TERC Inc.

Spatial Thinking Curriculum for Building Computational Skills in Elementary Grades K-5

Award Number: 1543204

Principal Investigator: Steven Moore

Organization: University of Redlands