Programs and Initiatives in the Directorate for Education and Human Resources
Why does the National Science Foundation invest in STEM education?

“We shall have rapid or slow advance on any scientific frontier depending on the number of highly qualified and trained scientists exploring it.”

Vannevar Bush
Science: The Endless Frontier
Advancing STEM Learning through Research

- Generate new knowledge about STEM learning & education
- Develop a diverse workforce ready to advance the frontiers of science and engineering for society
- Grow and sustain a STEM-literate public

National Science Foundation
Advancing STEM Learning at All Levels

- STEM Workforce
- Graduate School
- Postdoctoral Experiences
- Undergraduate Education
- Community College
- High School
- Middle School
- Elementary School
- Early Childhood Education

National Science Foundation
Advancing STEM Learning across Contexts

- Virtual Worlds
- Making
- Augmented Reality
- Games
- Museums
- Science Centers
- Online Learning
- Social Media
- Citizen Science
- Formal Education
- After-school Programs

National Science Foundation
EHR Themes

1. Learning & Learning Environments
2. Broadening Participation & Institutional Capacity
3. Workforce Development
# EHR Program Overview

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<th>Division</th>
<th>L&amp;LE</th>
<th>BP</th>
<th>WD</th>
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<tr>
<td><strong>Research on Learning (DRL)</strong></td>
<td>S&amp;CC</td>
<td>AISL DR-K12</td>
<td>ITEST STEM+C CSforALL BCC-EHR*</td>
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<td><strong>Undergrad Education (DUE)</strong></td>
<td>IUSE (EHR, GEOPATHS*, RED*, HSI) S-STEM</td>
<td>ATE* Noyce AD* C3P* REU-Sites</td>
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<td><strong>Graduate Education (DGE)</strong></td>
<td></td>
<td></td>
<td>SFS/CyberTraining/SaTC GRF / GRIP IGE NRT</td>
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<tr>
<td><strong>Human Resource Development (HRD)</strong></td>
<td>ADVANCE AGEP HBCU-UP TCUP DEL*</td>
<td>LSAMP CREST and RISE REU</td>
<td>PAEMST &amp; PAESMEM CREST</td>
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*Note: DRL, BP, WD, and HRD divisions are under the NSF's Directorate for Education and Human Resources (EHR). Each division supports different initiatives and programs focused on improving education and human resources in STEM fields. The table highlights some of the major programs and initiatives within each division. The asterisks (*) indicate specific programs or initiatives that are part of the respective divisions.*
Programs in the Division of Research on Learning in Formal & Informal Settings (DRL)

- **AISL**: Advancing Informal STEM Learning 17-573
- **CSforAll**: Computer Science for All 18-537
- **DRK-12**: Discovery Research PK-12 17-584
- **ITEST**: Innovative Technology Experiences for Students and Teachers 17-565
- **S&CC**: Smart and Connected Communities 18-520
- **STEM+C**: STEM + Computing Partnerships 17-535
Programs in the Division of Human Resource Development (HRD)

- **HBCU-UP**: HBCU Undergraduate Program 18-522
- **LSAMP**: Louis Stokes Alliances for Minority Participation 17-579
- **ADVANCE**: Increasing the Participation & Advancement of Women in Academic Science and Engineering Careers [new solicitation pending]
- **AGEP**: Alliances for Graduate Education and the Professoriate 16-552
- **TCUP**: Tribal Colleges and Universities Program 18-546
Programs in the Division of Human Resource Development (HRD)

- **CREST**: Centers of Research Excellence in Science and Technology 18-509
- **RISE**: Research Infrastructure for Science and Engineering 18-509
- **PAESMEM**: Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring 16-534
- **PAEMST**: Presidential Awards for Excellence in Mathematics and Science Teaching 16-534
Programs in the Division of Undergraduate Education (DUE)

- **IUSE**: Improving Undergraduate STEM Education 17-590
  - **IUSE: RED** 17-501
  - **IUSE: GEOPATHS** 17-574
  - **IUSE: HSI** 18-524

- **S-STEM**: NSF Scholarships in STEM 17-527

- **ATE**: Advanced Technological Education 17-568

- **NOYCE**: Robert Noyce Teacher Scholarship Program 17-541
Programs in the Division of Graduate Education (DGE)

- **SFS**: CyberCorps: Scholarship for Service 17-556
- **GRF**: Graduate Research Fellowship 16-588
- **GRIP**: Graduate Research Internship Program DCL 16-015
- **IGE**: Innovations in Graduate Education 17-585
- **NRT**: NSF Research Traineeship 18-507
- **CyberTraining**: Training-based Workforce Development for Advanced Cyberinfrastructure 18-516
- **SaTC**: Secure and Trustworthy Cyberspace 18-572
Crosscutting and Cross-divisional Programs

- **ECR**: EHR Core Research new solicitation pending
- **BCC-EHR**: Building Community and Capacity in Data Intensive Research in Education 17-532
- **AD**: Accelerating Discovery: Educating the Future STEM Workforce 18-1998
- **C3P**: Community College Cyber Pilot Program 18-1668
- **REU**: Research Experiences for Undergraduates 13-542
- **DEL**: Documenting Endangered Languages 16-576 and 16-617
EHR Core Research (ECR)

- NSF 19-508
- fundamental research in STEM education
- funds critical research areas that are essential, broad & enduring
- focuses on
  - STEM learning and learning environments
  - STEM workforce development
  - Broadening participation in STEM
Faculty Early Career Development Program (CAREER)

Faculty Early Career Development Program (CAREER) Includes the description of NSF Presidential Early Career Awards for Scientists and Engineers (PECASE)

PROGRAM SOLICITATION
NSF 17-537

REPLACES DOCUMENT(S):
NSF 15-555

National Science Foundation
Directorate for Biological Sciences
Directorate for Computer & Information Science & Engineering
Directorate for Education & Human Resources
Directorate for Engineering
Directorate for Geosciences
Directorate for Mathematical & Physical Sciences
Directorate for Social, Behavioral & Economic Sciences
Office of Integrative Activities
Office of International Science and Engineering

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):
July 18, 2017
Third Wednesday in July, Annually Thereafter
for BIO, CISE, EHR
July 20, 2017
Third Thursday in July, Annually Thereafter
for ENG
July 21, 2017
Third Friday in July, Annually Thereafter
for GEO, MRS, SBE
NSF’s Ten Big Ideas

**Research Ideas**
- Harnessing Data for 21st Century Science and Engineering
- Work at the Human-Technology Frontier: Shaping the Future
- Navigating the New Arctic
- Windows on the Universe: The Era of Multi-messenger Astrophysics
- The Quantum Leap: Leading the Next Quantum Revolution
- Understanding the Rules of Life: Predicting Phenotype

**Process Ideas**
- Mid-scale Research Infrastructure
- NSF 2026
- Growing Convergent Research at NSF
- NSF INCLUDES: Enhancing STEM through Diversity and Inclusion
Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES)

Bring together dedicated partners

Find approaches that work

Build a nation where everyone has opportunities in STEM
**NSF INCLUDES: Collaborative Infrastructure**

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<tr>
<th><strong>Vision</strong></th>
<th>• Engage the community in a shared vision</th>
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<tbody>
<tr>
<td><strong>Partnership</strong></td>
<td>• Provide a platform for collaborative action</td>
</tr>
<tr>
<td><strong>Goals &amp; metrics</strong></td>
<td>• Allow for evidence-based decision making</td>
</tr>
<tr>
<td><strong>Leadership &amp; communication</strong></td>
<td>• Increase communication and visibility</td>
</tr>
<tr>
<td><strong>Potential for expansion, scale, sustainability</strong></td>
<td>• Establish the capacity for expansion, sustainability and scale</td>
</tr>
</tbody>
</table>
STEM Entrepreneurship

- Technology Translation & Early Prototyping in Academia
  PFI: Partnerships for Innovation
  https://nsf.gov/PFI

- Entrepreneurship Education
  I-Corps:

- Create your Start-up!
  SBIR/STTR http://seedfund.nsf.gov
Research and Evaluation in EHR Proposals

All EHR awards should contribute to knowledge about STEM learning and learning environments, workforce development, or broadening participation.

Research
- Is integral to the project
- Contributes to generalizable knowledge
- Includes appropriate methods, depending on the research questions (qualitative, quantitative, or mixed methods)

Evaluation
- Projects have a way to assess process or outcomes
- Identifies an independent, external evaluator, depending on program solicitation requirements
Common Guidelines

• Foundational Research and Early-Stage or Exploratory Research
• Design and Development Research
• Efficacy Research
• Effectiveness Research
• Scale-up Research

Prospective Principal Investigators

- Track Funding Opportunities
- Engage with NSF
- Answer Fundamental Questions
- Seek Collaborations & Interdisciplinary Partnerships
Engage with NSF

• Submit Proposals
• Serve as Reviewers & Panelists
• Join Webinars
• Consider being a Rotator

Visit the EHR Website for information about EHR Divisions and Programs

Contact NSF Program Directors for Questions and Suggestions

National Science Foundation
<table>
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<tr>
<th>Goals</th>
<th>Rationale</th>
<th>Evaluation</th>
<th>Dissemination</th>
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<tbody>
<tr>
<td>What are you trying to accomplish?</td>
<td>Why do you believe that you have a good idea?</td>
<td>Why is your approach promising?</td>
<td>Are there ways to inform decisions with data?</td>
</tr>
<tr>
<td>What will be the outcomes?</td>
<td>Why is the problem important?</td>
<td>How will you know if you succeed?</td>
<td>How will others find out about your work?</td>
</tr>
<tr>
<td></td>
<td>How does it tie into previous literature/efforts?</td>
<td></td>
<td>How will you interest them?</td>
</tr>
</tbody>
</table>

*National Science Foundation*
Making Connections: Resource Centers

- **AISL**: Center for Advancement of Informal Science Education (CAISE) [informalscience.org/community](http://informalscience.org/community)

- **DRK-12**: Community for Advancing Discovery Research in Education (CADRE) [cadrek12.org](http://cadrek12.org)

- **ITEST**: STEM Learning and Research Center (STELAR) [stelar.edc.org](http://stelar.edc.org)

- **MSP**: Math and Science Partnership Network (MSPnet) [hub.mspnet.org](http://hub.mspnet.org)

- **CIRCL**: [http://circlcenter.org](http://circlcenter.org)

- **NSF INCLUDES**: Coordination Hub coming soon...
NSF Resources

• NSF: www.nsf.gov

• Funding Opportunities:  
  www.nsf.gov/funding/browse_all_funding.jsp

• Award Information:  www.nsf.gov/awardsearch

• Preparing Proposals:  https://www.nsf.gov/funding/preparing/

• Data Management Plan:  www.nsf.gov/bfa/dias/policy/dmp.jsp


• FastLane:  www.fastlane.nsf.gov
Follow solicitation/ announcement/ PAPPG guidelines

The Proposal and Award Policies and Procedures Guide (PAPPG) contains documents relating to NSF’s proposal and award process, including pre- and post-award information.