

# NSF Funding Opportunities for Informal STEM Education-Focused Projects

**AISL AWARDEE MEETING**

DECEMBER 6-8, 2023



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Directorate for STEM Education (EDU)

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# NSF Organizational Chart



Office of Equity and Civil Rights (OECR)

Office of the General Counsel (OGC)

Office of Integrative Activities (OIA)

Office of International Science and Engineering (OISE)

Office of Legislative and Public Affairs (OLPA)

## Office of the Director (OD) Director

Deputy Director

Chief Operating Officer

Chief of Research Facilities

Chief Information Officer

Chief of Research Security, Strategy and Policy

Chief of Staff

## NSB National Science Board

Chair, Vice Chair,  
NSB Executive Officer

## Office of the Inspector General (OIG)

Directorate for Biological Sciences (BIO)

Directorate for Computer and Information Science and Engineering (CISE)

Directorate for STEM Education (EDU)

Directorate for Engineering (ENG)

Directorate for Geosciences (GEO)

Directorate for Mathematical and Physical Sciences (MPS)

Directorate for Social, Behavioral and Economic Services (SBE)

Directorate for Technology, Innovation and Partnerships (TIP)

Office of Budget, Finance and Award Management (BFA)

Office of Information and Resource Management (OIRM)

# NSF Funding Directorates

## Directorate for STEM Education (EDU)

Directorate for Biological Sciences (BIO)

Directorate for Engineering (ENG)

Directorate for Geosciences (GEO)

Directorate for Mathematical and Physical Sciences (MPS)

Directorate for Social, Behavioral and Economic Sciences (SBE)

Directorate for Technology, Innovation and Partnerships (TIP)

Directorate for Computer & Information Science and Engineering  
(CISE)



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# NSF Funding Directorates

## Directorate for STEM Education (EDU)

Division of Research on Learning in Formal & Informal Settings (DRL)

Division of Undergraduate Education (DUE)

Division of Graduate Education (DGE)

Division of Equity for Excellence in STEM (EES)

AISL Program Lead



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## Division of Research on Learning in Formal and Informal Settings (DRL)

DRL invests in the improvement of STEM learning for people of all ages by promoting innovative research, development, and evaluation of learning and teaching across STEM disciplines in formal and informal learning settings



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# NSF Priorities





# Missing Millions

- For the STEM workforce to be representative of all Americans, by 2030 we will need more than 30 million additional women, African Americans, Hispanic Americans, and Native Americans.
- NSF wide priority and EDU priority





# Emerging technologies

- AI, data science, quantum information science, semiconductors/microelectronics
- Research and education priority
- Closely related to Missing Millions





# CHIPS and Science Act (2022)

- Semiconductor education
- Informal STEM learning
- National Academies studies on K-12 STEM education and rural STEM education/workforce





# Division of Research on Learning in Formal and Informal Settings (DRL)

## Programs Supported by DRL

- **Advancing Informal STEM Learning (AISL)**  
Solicitation NSF 22-626
- **CAREER – Faculty Early Career Development**  
Solicitation 22-586
- **Innovative Technology Experiences for Students and Teachers (ITEST)**  
Solicitation NSF 22-585
- **Racial Equity in STEM Education (RE)**  
Solicitation 22-634
- **Education Core Research (ECR)**  
Solicitations NSF 21-588;  
BCSER NSF 22-548
- **Discovery Research preK-12 (DRK-12)**  
Solicitation NSF 23-596
- **CsforALL** Solicitation TBD
- **Research on Innovative Technologies for Enhanced Learning (RITEL)**  
Solicitation 22-624
- **NSF INCLUDES**  
Solicitation 22-622





# Advancing Informal STEM Learning (AISL) Program

Current solicitation: 22-626

Deadline: January 10, 2024

Annually, 2<sup>nd</sup> Wednesday in January



[informalscience.org](http://informalscience.org)

[drlaisl@nsf.gov](mailto:drlaisl@nsf.gov)



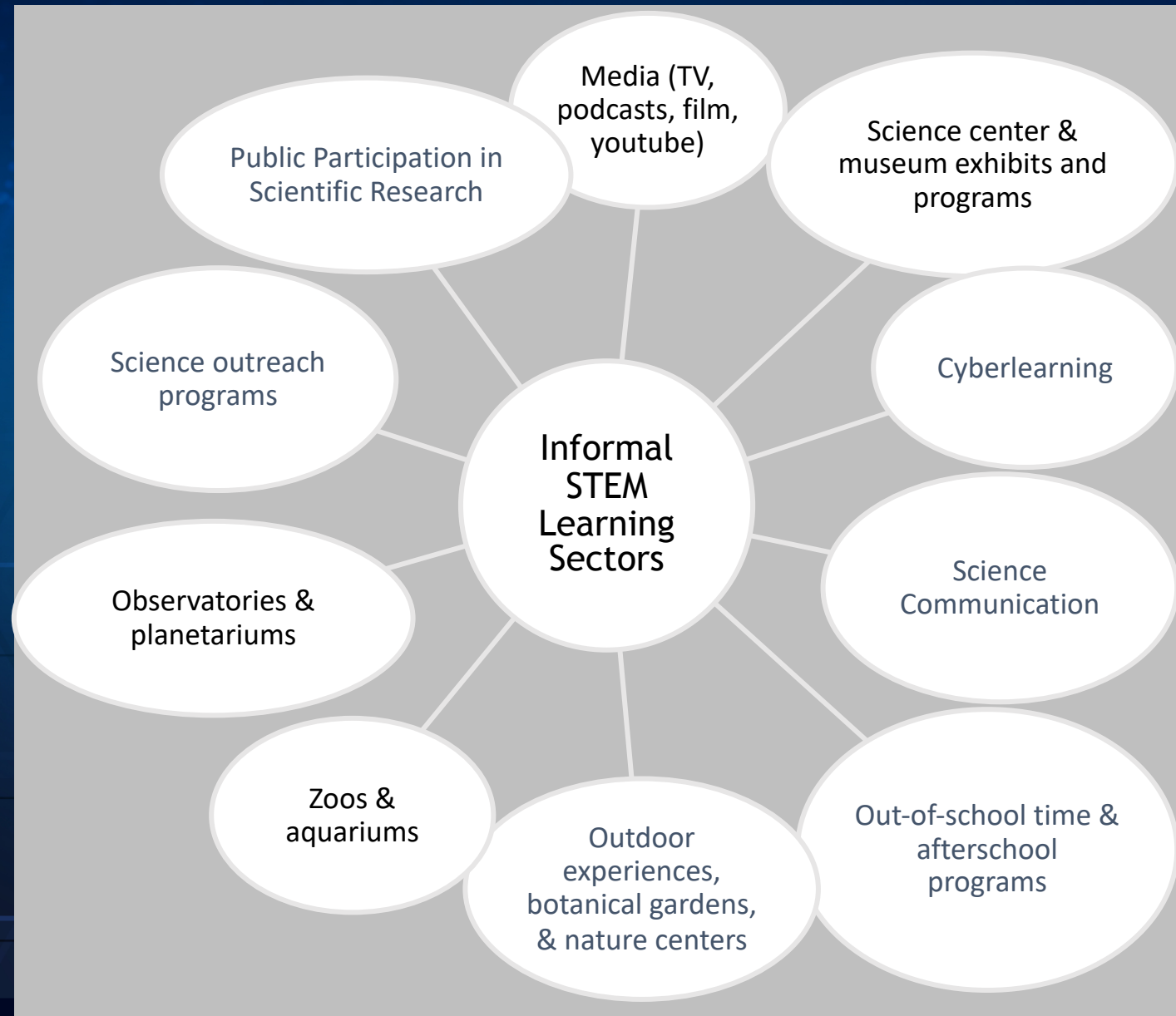
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# Advancing Informal Stem Learning (AISL)

Supports research on the design, development and impact of STEM learning opportunities and experiences for the public in informal educational environments.





# AISL Goals

1. Research and practice, with continued focus on investigating a range of informal STEM learning experiences and environments that make lifelong learning a reality.
2. Proposals that center equity and belonging, and further the well-being of individuals and communities who have historically been and continue to be excluded, underserved, or underrepresented.
3. High-quality plans to generate knowledge through research, evaluation, and practice.





# AISL Examples of Funded Projects

Syntheses	Workshops & Conferences	Research & Development	Wide-Reaching
<p>Research Synthesis of Effective Inclusion Practices for Neurodiverse K-12 Learners in Informal STEM Learning Contexts</p> <p>(2115542)</p>	<p>A Workshop on Assessment and Evaluation Tools for Makerspaces</p> <p>(2138223)</p>	<p>Technology Education for Women in Transition</p> <p>(1907002)</p> <p>Weaving Indigenous Identity, Cultural Values, and Environmental Science Together for Sustainable Tribal Land Management and Resource Career Pathways</p> <p>(2117322)</p>	<p>Ice Worlds: A Giant Screen Film and Outreach Project</p> <p>(2116070)</p> <p>RAIN - Rural Activation and Innovation Network</p> <p>(1612555)</p>





# Smart and Connected Communities (SCC)

Current solicitation: 22-529

Deadline: Accepted anytime until  
April 1, 2024

For AISL: [DRLAISL@nsf.gov](mailto:DRLAISL@nsf.gov)





# SCC Focus

Supports use-inspired research that addresses communities' social, economic and environmental challenges. Projects must work with community stakeholders on pilots that integrate intelligent technologies with the natural and built environments.

Tracks include:

Planning Grants (PG)

Integrated Research Grants (IRGs)



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# SCC: Examples of Funded Projects

Enabling Smart Cities in Coastal Regions of Environmental and Industrial Change:  
Building Adaptive Capacity through Sociotechnical Networks on the Texas Gulf Coast

Designing Smart, Sustainable Risk Reduction in Hazard-Prone Communities: Modeling  
Risk Across Scales of Time and Space

Diaspora, Agriculture, & AI: Community-based Integration of Smart Technologies into  
Black Diasporic Agricultural Practices

Closed-loop Intervention to Promote a Supportive and Interactive Environment  
around Children



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# Faculty Early Career Development Program (CAREER)

Current solicitation: 23-586

Deadline: 4<sup>th</sup> Wednesday in July

[nsf-ccc@nsf.gov](mailto:nsf-ccc@nsf.gov)





# CAREER Focus

NSF-wide activity supporting early-career researchers with potential to serve as role models in research and education and to lead advances in the mission of their department or organization.

- EDU appropriate research qualifies
- Single PI project
- 5 years
- PI must meet eligibility requirements
  - e.g., assistant professor, tenure-track or equivalent (i.e., **informal**)





# CAREER: Examples of Funded Projects

- An Asset-based Longitudinal and Intersectional Analysis of Black Women's Experiences within Informal and Formal Engineering Education
- Talking Science: Early STEM Identity Formation Through Everyday Science Talk
- Broadening Perspectives of Science, Technology, and Culture Through Community-Driven Design of Place-Based Storytelling Experiences
- Investigating Black Youths' Engineering, Innovation, and Design Practices at the Intersection of Museum and Home/Family Learning





# Innovative Technology Experiences for Student and Teachers (ITEST)

Current solicitation: 22-585

Deadline: August 9, 2024



[drlitest@nsf.gov](mailto:drlitest@nsf.gov)





# ITEST Focus

ITEST is responsive to the Nation's needs for advancing a technologically-competitive STEM / ICT workforce, and a citizenry well-prepared to enter emerging STEM/ICT careers.



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# ITEST Pillars

1. Innovative uses of technologies in teaching & learning
2. Partnerships for career & workforce preparation
3. Strategies for equity in STEM education

## Emerging critical areas include:

- artificial intelligence
- blockchain,
- cybersecurity
- data science
- environmental science
- quantum information science & engineering
- semiconductors & microelectronics





# ITEST Examples of Funded Projects

Syntheses, Workshops & Conferences	Exploratory	Developing & Testing	CAREER
<p>Synthesis: Impact of integrating innovative technologies in STEM classrooms on K-12 students' STEM career outcomes</p> <p>(1949437)</p>	<p>Robot-Mediated Learning: Exploring School-Deployed Collaborative Robots for Homebound Children</p> <p>(2024953)</p>	<p>A Culturally-Relevant Computer Science Education Program to Expand Equity, Access, and Opportunity for Native American High School Students</p> <p>(2049023)</p> <p>Engaging Rural Students in Artificial Intelligence to Develop Pathways for Innovative Computing Careers</p> <p>(2148680)</p>	<p>CAREER: Integrating Robotics and Socio-emotional Learning for Incarcerated Middle School Students</p> <p>(2238882)</p>





Informational Webinar  
December 12, 2023  
02:30-3:30 PM Eastern Time

# Innovative Technology Experiences for Students and Teachers Resource Center (ITEST-RC)

Current solicitation: 24-500  
Deadline: March 6, 2024

[drlitest@nsf.gov](mailto:drlitest@nsf.gov)





# ITEST Resource Center

1. A Resource Center for ITEST that is visionary in actualizing equity in STEM learning environments that inspire and prepare youth to pursue careers in the STEM workforce of the future.
2. Will facilitate dialogue across stakeholders as it actively elicits new perspectives on potentially transformative approaches to pre-K through 12 workforce preparation among communities and organizations that have been overlooked or under-consulted in this work.





# NSF's Eddie Bernice Johnson Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES) Initiative

Current solicitation: 22-622

Deadline: 4<sup>th</sup> Tuesday in October

Deadline varies by Project Type

[nsfincludes@nsf.gov](mailto:nsfincludes@nsf.gov)





## **NSF INCLUDES Focus**

A comprehensive, national effort to enhance U.S. leadership in STEM discovery and innovation, focused on NSF's commitment to ensuring accessibility and inclusivity in STEM fields. The vision is to catalyze the STEM enterprise to work collaboratively for inclusive change, resulting in a STEM workforce that reflects the diversity of the Nation's population.

**TENET 1: Broadening participation in STEM at scale**

**TENET 2: Building collaborative infrastructure**





# INCLUDES: Examples of Funded Projects

- NSF INCLUDES Alliance: Broadening Career Pathways in Food, Energy, and Water Systems with and within Native American Communities (Native FEWS Alliance)
- Transforming Rural-Urban Systems: Trajectories for Sustainability in the Intermountain West
- NSF INCLUDES Alliance: The Alliance of Students with Disabilities for Inclusion, Networking, and Transition Opportunities in STEM
- NSF INCLUDES Alliance: STEM Opportunities in Prison Settings (STEM-OPS)
- DEDICATE: Data Science Equity-Driven Inquiry to Create Accessible Project-based Training for Social Impact Education





# EDU Racial Equity in STEM Education (Racial Equity) Program

Current solicitation: 22-634

Deadline: December 5, 2023

Annually in October

[EDURacialEquity@nsf.gov](mailto:EDURacialEquity@nsf.gov)





# Racial Equity Focus

Supports bold, groundbreaking and potentially transformative projects addressing systemic racism in STEM education and workforce development through research (both fundamental and applied) and practice.

Supports projects focused on advancing racial equity in STEM education and workforce development that are led or co-developed by individuals and communities most impacted by the inequities caused by systemic racism.



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# Racial Equity: Examples of Funded Projects

- Building Capacity to Institutionalize Equity in Outdoor and Environmental Science Education
- Co-designing STEM Education with Communities: Centering History, Heterogeneity, Power, and Place
- Addressing historic and systemic racial inequities: Coeur d’Alene land-based STEM education
- Black Girls as Creators: an intersectional learning ecosystem toward gendered racial equity in Artificial Intelligence education





# EDU Core Research (ECR) Program

Current solicitation: 21-588  
Deadline: 1<sup>st</sup> Thursday in October



[ECR@nsf.gov](mailto:ECR@nsf.gov)





# ECR Focus

Supports **fundamental research** (curiosity-driven basic research and use-inspired basic research) that contributes to the **general, explanatory knowledge that underlies STEM education**. The ECR program supports a wide range of fundamental STEM education research activities aimed at learners of all groups and ages in formal and informal settings.

1. Research on STEM Learning and Learning Environments
2. Research on Broadening Participation in STEM fields
3. Research on STEM Workforce Development





# ECR: Examples of Funded Projects

- The neurobiological mechanisms underlying gesture's role in mathematical learning
- Examining Blackness in Postsecondary STEM Education through a Multidimensional-Multiplicative Lens
- Trajectories into Early Career Research
- Improving Evaluations of STEM Programs: An Empirical Investigation of Key Design Parameters
- Using Augmented Reality to Enhance Attention in STEM Learning for Students with Executive Function Disabilities





# Research on Innovative Technologies for Enhanced Learning (RITEL)

Current solicitation: 22-624

Deadline: January 24 & November 5, 2024





# RITEL Focus

Supports early-stage research in emerging technologies such as AI, robotics and immersive or augmenting technologies for teaching and learning that respond to pressing needs in real-world educational environments.



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# RITEL: Examples of Funded Projects

- Using Artificial Intelligence to Transform Online Video Lectures into Effective and Inclusive Agent-Based Presentations
- Broadening Participation for Remote Communities: Situated Distance Telepresence Mentoring through Embodied Communications
- Broadening Participation for Remote Communities: Situated Distance Telepresence Mentoring through Embodied Communications
- Learning Software Engineering by Contributing to Real Projects With Chatbot Assistance





# Research Coordination Networks (RCN)

Current solicitation: 23-529  
Deadline: Accepted on program  
deadline, ie AISL is Jan. 10, 2024

For AISL: [DRLAISL@nsf.gov](mailto:DRLAISL@nsf.gov)





# RCN Focus

Supports networks that foster communication and new collaborations among scientists, engineers and educators who share a common interest in a new or developing area of science or engineering. The goal is to advance a field or create new directions in research or education.

Note: RCN supports networks. It does not support primary research nor program implementation.

*Proposals are submitted to the RCN solicitation and indicate at program, such as AISL, to which the proposal aligns.*



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# RCN: Examples of Funded Projects

Developing a Network to Coordinate Research on Equity Practices and Cultures in STEM Maker Education

An Incubator to Enable Scalable Education Equity Research with Terracotta



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# What Research do the Programs Fund?

- Review program solicitations
- Review current and/or past awards in a particular division or program

## DIVISION OF RESEARCH ON LEARNING IN FORMAL AND INFORMAL SETTINGS (DRL)

- [View Active Awards](#)
- [View All Awards](#)

### **Understanding and Improving Learning from Online Mathematics Classroom Videos**

Award Number:1621253; Principal Investigator:Michelle Perry; Co-Principal Investigator:Megan Schleppenbach Bates, Megan Schleppenbach Bates, Cheryl Moran, Joseph Robinson-Cimpian; Organization:University of Illinois at Urbana-Champaign;NSF Organization:DRL Start Date:08/15/2016; Award Amount:\$2,209,143.00; Relevance:64.0;

### **Collaborative Research: Supporting Teachers in Responsive Instruction for Developing Expertise in Science**

Award Number:1813713; Principal Investigator:Marcia Linn; Co-Principal Investigator:Elizabeth Gerard; Organization:University of California-Berkeley;NSF Organization:DRL Start Date:09/01/2018; Award Amount:\$2,638,285.00; Relevance:64.0;

### **Culturally Responsive Indigenous Science: Connecting Land, Language, and Culture**

Award Number:1720931; Principal Investigator:Zoe Strong; Co-Principal Investigator:Kimberly Christen, Zoe Strong; Organization:Washington State University;NSF Organization:DRL Start Date:09/01/2017; Award Amount:\$2,481,274.00;





# Why review for the NSF?

[Informalscience.org](http://Informalscience.org)

Invaluable experience if you are interested in submitting (or resubmitting) your own proposal.

Meet others in the STEM community and learn about what kind of projects are being proposed.

Add to your professional development. You can put panel experience on your CV/resume!