



DISCOVERY
RESEARCH
PREK–12

PI Meeting
June 28–30, 2023 Arlington, VA



AGENDA

WEDNESDAY, JUNE 28, 2023

- 12:00–2:00 PM** **Early Career Mock Proposal Review**
Michael Steele, National Science Foundation
CADRE Fellows receive an orientation to the DRK–12 proposal review process and engage in a mock review led by an NSF program director.
[SLIDES](#)
- 3:00–4:00 PM** **First-Time PI Orientation**
Program Officers, National Science Foundation; Ilana Horn, Vanderbilt University; Eric Wiebe, North Carolina State University
This session guides first-time PIs in managing a DRK-12 award. Program directors provide strategies for working with them, documenting changes, and reporting requirements. The session includes a Q&A with PIs and program directors. [SLIDES](#)
- 4:00–4:30 PM** **CAREER Awardee Meeting**
James Moore, National Science Foundation
CAREER awardees are invited to this listening session with the assistant director of the Directorate for STEM Education.
- 5:00–5:45 PM** **NSF Welcome**
Asli Sezen-Barrie, Evan Heit, and James Moore, National Science Foundation
NSF program officers present NSF and the Directorate for STEM Education’s strategic vision, and the role that DRK–12 projects have in that vision. [RECORDING](#) | [SLIDES](#)
- 5:45–6:15 PM** **Post-Reform Education, the Data Revolution, and DRK–12**
Ivory Toldson, Howard University
Toldson discusses how DRK–12 awardees are playing an important role in advancing post-reform education and ushering in a data revolution to help ensure that all students are given an equitable educational opportunity in STEM. [RECORDING](#) | [SLIDES](#)

9:00–10:15 AM

Concurrent Sessions

- Building Teacher Capacity to Support Interdisciplinary Computational Thinking**
Anthony Negron, New York Hall of Science; Rebecca Dovi, CodeVA; Lauren Margulieux, Georgia State University; Heather Sherwood, Education Development Center; Colby Tofel-Grebl, Utah State University
 Participants explore multiple projects that are preparing teachers to integrate computational thinking into core disciplinary areas across K–8 grade levels. [SLIDES](#)
- Co-designing Learning Progression-Aligned Mathematics Activities That Support Collaborative Discourse** (*Working session: 60 min.*)
Edith Graf, ETS
 In this session, participants generalize from a concrete activity to elaborate a set of principles to guide the development of mathematics activities that foster meaningful collaborative discourse. [SLIDES](#)
- Creating and Sustaining Partnerships in Professional Development Projects**
David Jabon, DePaul University; David Wilson, SUNY Buffalo State; Eileen Murray, Consultant
 This session focuses on how the presenters have leveraged three existing partnerships with varied institutions among teachers, schools, districts, and nonprofit organizations to positively impact mathematics teaching in highly diverse populations. [SLIDES](#)
- Equity’s Presence Within Science/STEM Education Research, Policy, and Practice: A Campaign to Center Equity**
John Settlage, University of Connecticut; Brian Williams, Georgia State University; Jessica Thompson, University of Washington; María González-Howard, The University of Texas at Austin; April Luehmann, University of Rochester
 Equity tends to be pushed to the background in science/STEM education activities and outcomes. Presenters report on national conversations centering on equity. [SLIDES](#)
- Strengthening Dissemination Practices by Leveraging Strengths** (*Technical assistance session: 60 min.*)
Jonathan Bostic, Bowling Green State University; Erin Krupa, North Carolina State University; Toni May, Drexel University
 In this session, explore ways to promote broader impact and intellectual merit through purposeful work across a project’s team and personnel, particularly through dissemination practices. [SLIDES](#)

- **Using AI to Promote Equitable Science Teaching and Learning**
Xiaoming Zhai, University of Georgia; Leonora Kaldaras, University of Colorado Boulder; Kevin Haudek, Michigan State University; Christopher Harris, WestEd; Yue Yin, University of Illinois Chicago
Researchers discuss two projects that use AI to automatically evaluate evidence-based explanations and scientific models and provide actionable and equitable feedback to teachers and students. [SLIDES](#)

10:30–11:45 AM

Concurrent Sessions

- **Co-designing in Partnership as a Strategy for Supporting Justice in STEM Education**
Philip Bell, University of Washington Seattle; William Pennel, University of Colorado Boulder; Megan Bang, Northwestern University
This session engages participants with ideas and approaches for co-design that work toward justice and equity in STEM education using solidarity-based design. [SLIDES](#)
- **Conceptualizing Your Dissemination Plans to Create Broader Impacts**
Deborah Hanuscin, Western Washington University; Jamie Mikeska, ETS; Zandra de Araujo, University of Florida
In this session, participants engage with panelists and one another to identify innovative synergies between dissemination and broader impacts in their projects. [SLIDES](#)
- **Issue-based Argumentation to Support Literacy Integration and Learning in STEM**
Amy Lannin and Samuel Otten, University of Missouri
This presentation provides examples of how teachers integrated literacy practices into their STEM courses. [SLIDES](#)
- **Natural Language Processing (NLP) Data Techniques with Symbolic and Nonsymbolic Mathematical Language**
Cassandra Griger, University of Iowa; Yasemin Copur-Gencturk, University of Southern California
This data literacy session demonstrates a framework for preprocessing symbolic and non-symbolic text data using constructed responses from middle school preservice teachers. [SLIDES](#)
- **Professional Development for Culturally Responsive STEM Teaching in Diverse Rural Communities**
Rebecca Sansom, Brigham Young University; Angelina Castagno, Northern Arizona University; Frank Bowman, University of North Dakota; Brooke Moore, Fort Hays State University; Rebecca Dovi, CodeVA
Participants explore how to support rural STEM teachers in engaging and responding to their students' diverse knowledge and discuss areas for future research. [SLIDES](#)

- **Socioscientific-Issues Framework to Promote Discussions on Social Justice** (*Working session: 60 min.*)

Augusto Z. Macalalag, Jr., Arcadia University; Greer Richardson, LaSalle University; Lisa Marco-Bujosa, Villanova University; Ling Liang, LaSalle University

Participants collaboratively discuss how to revise/adapt existing frameworks to attend to issues of equity and justice. [SLIDES](#)

11:45 AM–12:45 PM

Special Interest Lunches

- **Meet the CADRE Fellows**

Facilitator: Terrell Morton, University of Illinois Chicago

Join current and former Fellows for informal networking and discussion about early career scholarship that supports equity in STEM education research.

- **Data Science Education**

Facilitators: Chad Dorsey and Kate Miller, Concord Consortium

Attendees with an interest in data science education are welcomed to network and discuss opportunities to advance the field.

- **Managing Educational Research Challenges**

Facilitator: Ilana Horn, Vanderbilt University

Join this professional learning community to discuss the challenges and potential solutions of navigating the ever-changing landscape of U.S. education, including teacher shortages, limited access to classrooms, and hesitation in some communities.

12:45–2:00 PM

Structured Poster Sessions

Learn about current research addressing key areas of the DRK–12 portfolio. Following poster presentations and networking, presenters and attendees discuss cross-cutting themes and opportunities.

- **Computer Science and Computational Thinking**

Facilitators: Satabdi Basu, SRI International; Ido Davidesco, University of Connecticut [POSTERS](#)

- **Data Science Education**

Facilitators: Kate Miller, Concord Consortium; Kirsten Daehler, WestEd [POSTERS](#)

- **Early STEM Education (PreK–Grade 5)**

Facilitators: Chelsea Andrews, Tufts University; Jennifer Sub, George Mason University [POSTERS](#)

- **Inclusive STEM Education**

Facilitators: Angelina Castagno, Northern Arizona University; Nancy Songer, University of Utah [POSTERS](#)

- **Measuring Teacher Change**
Facilitators: Jinfa Cai, University of Delaware; Jamie Mikeska, ETS [POSTERS](#)
- **Research and Practice Partnerships**
Facilitator: Jessica Thompson, University of Washington [POSTERS](#)
- **Student Assessment**
Facilitators: Linda Morell, University of California, Berkeley; Xiaoming Zhai, University of Georgia [POSTERS](#)

2:15–3:30 PM

Concurrent Sessions

- **Centering Place to Craft Meaningful Learning in Research–Practice Partnerships**
Carolyn Staudt, Concord Consortium; Alan Berkowitz, Cary Institute of Ecosystem Studies; Kevin Garner, Baltimore City Public Schools
This session explores how centering local people, places, and phenomena can shift discourses in research–practice partnerships to open new avenues for learning and growth. [SLIDES](#)
- **Classroom-based Assessment: Implications for Researchers and Practitioners**
Christopher Harris, WestEd; Eric Wiebe, North Carolina State University; Okhee Lee, New York University; Xiaoming Zhai, University of Georgia; Ryan Seth Jones, Middle Tennessee State University
This session covers the CADRE-sponsored report *Classroom-based STEM Assessment: A Synthesis Report*. Presenters lead an interactive discussion of the implications of the report for STEM practice and DRK–12 research and policy. [SLIDES](#)
- **Defining DEIJ Within Contemporary DRK–12 Research and Praxis and Determining the Future of “Social Justice” Work** (*Working session*)
Terrell Morton, University of Illinois Chicago
This working session unpacks how the DRK–12 community defines, operationalizes, and envisions the future of diversity, equity, inclusion, justice, and/or liberation within K–12 STEM. [SLIDES](#)
- **Funding Opportunities Across NSF**
Program Officers, National Science Foundation
Join NSF program officers to learn about programs and initiatives that offer funding that may align with your research agenda. [SLIDES](#)
- **Strategies for Building Authentic Partnerships with Minority-Serving Institutions**
Moderator: Danielle Ferguson, American Institutes for Research
Panelists: Dawit Haile, Virginia State University; Alejandra Sorto, Texas State University San Marcos; Roni Ellington, Morgan State University
Panelists from minority-serving institutions discuss strategies for building authentic partnerships that are equitable, are mutually beneficial, and support efforts to broaden access to NSF funding.

4:00–5:00 PM

Poster Hall [\(VIRTUAL POSTERS\)](#)

9:00–10:00 AM

Poster Hall ([VIRTUAL POSTERS](#))

10:15–11:30 AM

Concurrent Sessions

- **Asset-based Approaches to Broadening Participation in STEM**

Shakbnoza Kayumova, University of Massachusetts Dartmouth; Beatriz Quintos, University of Maryland; Marta Civil, University of Arizona; Lucia I. Méndez, University of North Carolina Greensboro; María González-Howard, The University of Texas at Austin

In this session, multiple projects describe applications of various asset-oriented pedagogies (including translanguaging, community-sustaining pedagogies, and STEAM) to support broadening participation in STEM.

- **Leveraging AI Tools in STEM Education**

Marcia Linn and Allison Bradford, University of California, Berkeley; Brian Riordan, ETS; Sadhana Puntambekar, University of Wisconsin-Madison; Charles Xie, Institute for Future Intelligence; Rebecca Passonneau, Pennsylvania State University; ChanMin Kim, Pennsylvania State University

Following demos of transformer-based AI models, adaptive feedback for engineering design, and content assessment of expert explanations, audience members brainstorm, discuss, and synthesize. [SLIDES](#)

- **Opportunities, Obstacles, and Solutions: Collaborating with School Districts on Large Classroom-based Studies**

Patrick Smith, Horizon Research, Inc.; Christopher Wilson, BSCS Science Learning; Christian Doabler, The University of Texas at Austin; Megan Rojo, University of North Texas; William Pennel, University of Colorado Boulder

Attendees learn from DRK–12 PIs about recruiting school districts, schools, and teachers for large school-based studies and have opportunities to discuss their own experiences in small groups. [SLIDES](#)

- **Teacher Preparation and Preservice Education** (Roundtable session: 60 min.)

Facilitator: Michele Korb, California State University, East Bay

In this roundtable, participants discuss exploring strategies to improve preservice teacher education—including developing coherence across university, placement, and school settings—share experiences, and generate research and collaboration ideas.

- **The Role of Context in Education Innovations**

Alina Martinez, Mathematica

Participants explore the role of context in their professional development research and have an opportunity to connect with other projects whose context features are similar or complementary. [SLIDES](#)

11:45 AM–12:30 PM

NSF Town Hall

Moderator: Evan Heit, National Science Foundation

NSF program officers address audience questions. [RECORDING](#)