MEETING OVERVIEW

The Community for Advancing Discovery Research in Education (CADRE), the resource network for NSF DRK–12 awardees, is pleased to host the 2018 DRK–12 PI Meeting. The overarching goal of the meeting is to engage the DRK–12 and STEM+C communities in building and sharing new knowledge, best practices, and tools critical to increasing the impact and sustainability of our collective work over time. The meeting will provide opportunities for learning, networking, and substantive conversations for approximately 350 participants, including DRK–12 awardees, a group of STEM+C awardees, NSF program directors, CADRE Fellows, postdocs, and guests.

The 2018 DRK–12 PI Meeting will take place on June 6–8 at the Washington Wardman Park Marriott Hotel in Washington, D.C. The meeting will officially begin late afternoon on June 6 and end midday on June 8. Invited projects will be allowed one registrant (PIs are encouraged to attend) during the initial registration period. At the end of that period, if space remains, CADRE will open registration to additional project members.[1]

MEETING THEME

Nexus of Change:
Exploring the Intersections Between Broadening Participation, STEM and Computer Science Disciplines, and Technological Innovations in Education

Broadening participation, STEM and computer science disciplines, and technological innovations are three domains that shape the landscape of STEM education (see Figure 1). DRK–12 and STEM+C projects are situated often at the intersections of two of these domains and sometimes at the nexus of all three. The 2018 DRK–12 PI Meeting will highlight how this cross-domain, collaborative work both capitalizes on the affordances and meets the challenges that emerge in these spaces, as well as how this work contributes to reaching the goal of the *10 Big Ideas for Future NSF Investments* (https://www.nsf.gov/about/congress/reports/nsf_big_ideas.pdf).[2]

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[1] Additional information about meeting logistics and registration will be sent separately.
[2] *10 Big Ideas for Future NSF Investments* includes (a) NSF INCLUDES: Enhancing Science and Engineering Through Diversity, (b) The Future of Work at the Human–Technology Frontier, and (c) Harnessing Data for 21st Century Science and Engineering.
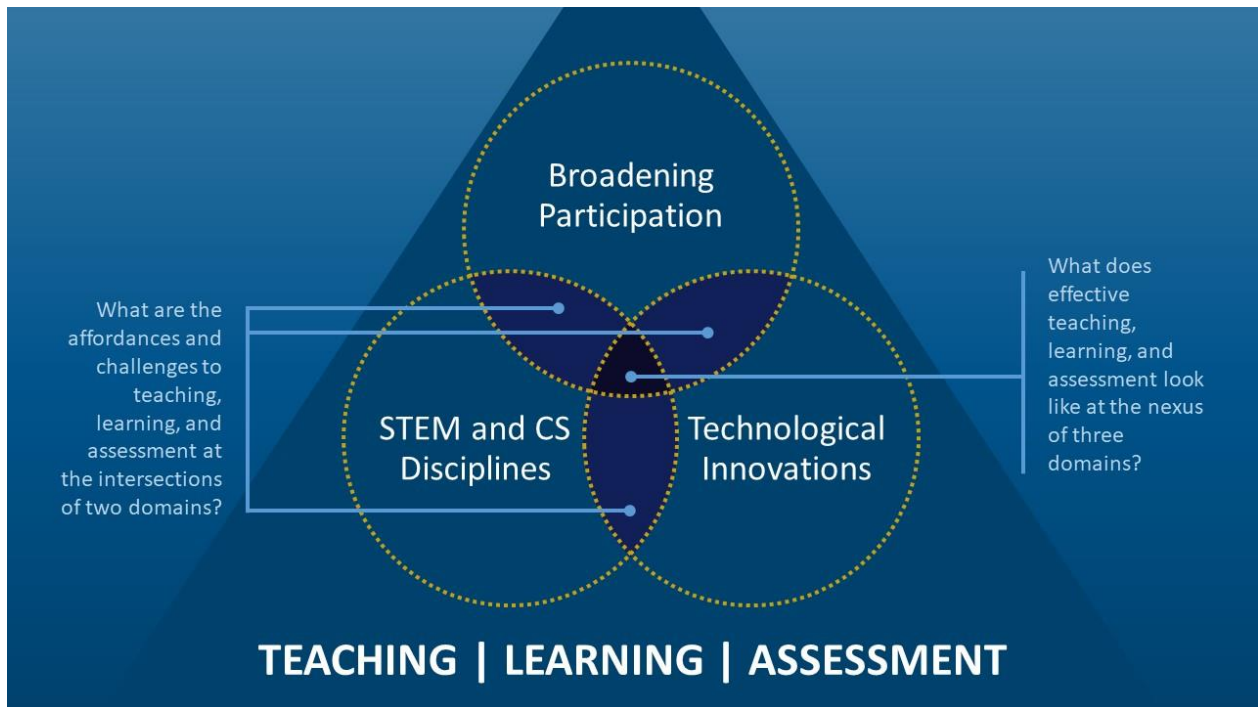
Figure 1. Intersections and nexus of broadening participation, STEM and computer science disciplines, and technological innovations.

Broadening participation in STEM education is becoming ever more critical as traditionally underrepresented groups in terms of socioeconomic status and race/ethnicity are now the majority across the nation. Furthermore, English learners make up a sizable and the fastest growing subset of the U.S. student population. Broadening participation also includes students with disabilities and cognitive differences, women and girls, students in rural areas, and other student groups that are underserved and/or underrepresented in STEM.

The increasingly diverse student population is expected to meet new college- and career-ready content standards by the end of high school, including the *Common Core State Standards for Mathematics* and the *Next Generation Science Standards.* In particular, the new content standards call for all students to engage in academically rigorous, language-intensive STEM disciplinary practices (e.g., reasoning, developing and using models, arguing from evidence, constructing explanations). In addition, the *STEM Education Act of 2015* states that "'STEM education' means education in the disciplines of science, technology, engineering, and mathematics, including computer science" (https://www.congress.gov/bill/114th-congress/house-bill/1020/text)—formally expanding the definition to highlight computer science within the school curriculum. Simultaneously, computational thinking, computer science, and data science are becoming increasingly essential for all students to become STEM professionals or participants in an information society.

Technological innovations are not only changing the nature of the STEM workforce; they are also transforming the landscape of teaching, learning, and assessment. For instance, technology-based assessments can generate new insights into students' developing understandings and give teachers unprecedented access to data that can support more personalized learning or enable

intelligent tutoring systems to customize student learning. Technological innovations make STEM learning experiences more accessible to a broad spectrum of learners and enable them to build on their unique strengths.

MEETING STRUCTURE

The 2018 DRK–12 PI Meeting will examine how the collective work of DRK–12 and STEM+C projects can transform the STEM landscape for all students, focusing on the intersecting domains of broadening participation, STEM and computer science disciplines, and technological innovations. Sessions will explore the opportunities and challenges to teaching, learning, and assessment at the intersections of any two domains and the nexus of all three. Plenary presentations, concurrent sessions, and working sessions will build on the DRK–12 and STEM+C portfolios of research and development projects, and the interdisciplinary knowledge and expertise of the DRK–12 and STEM+C participants.

The meeting program will begin with the framing plenary that presents big ideas, central questions, and current challenges—particularly at the nexus of the three domains—that we face as a nation and as education researchers. Then, participants will be invited to delve more deeply into the different spaces of this landscape:

1) Broadening Participation and STEM and Computer Science Disciplines, e.g., What are the opportunities and challenges in engaging diverse student groups in core concepts and practices within and across the STEM and computer science disciplines?
2) STEM and Computer Science Disciplines and Technological Innovations, e.g., How are technological innovations transforming student assessment of STEM and computer science practices?
3) Technological Innovations and Broadening Participation, e.g., What prior knowledge and skills do students with diverse backgrounds and abilities bring to gaming?

Mini-plenaries around each of these three spaces will be followed by concurrent sessions in a range of formats (described below) that focus on specific approaches, opportunities, and challenges that occur at various points of intersection between domains.

A fourth strand of sessions will address project design, implementation, and dissemination (e.g., models and methodologies to improve and build replication across geographically diverse rural areas). Methodology and measurement may also fall within this strand (e.g., mediation and moderation analysis of demographic subgroups). Other topics may include dissemination, partnerships, sustainability, and scale-up.

The meeting will close with reflections on thematic discussions and relate back to the framing questions introduced in the opening.

CALL FOR PROPOSALS

CADRE, NSF, and the DRK–12 PI Meeting Committee[3] are pleased to announce a Call for Proposals in response to the 2018 DRK–12 PI Meeting theme. The Call for Proposals, as well as the meeting theme, are informed by the input of the DRK–12 PIs through survey responses, past DRK–12 PI Meeting evaluations, NSF, and the PI Meeting Committee.

Session Content and Structures
CADRE invites proposals for awardee-led concurrent sessions that are responsive to the theme of the meeting and address topics of potential interest to subgroups of PIs. Sessions should go beyond a simple showcase of project work. Rather, presenters should address multiple perspectives on the theme outlined above and respond to the following questions:

1) What points of intersection between two or all three of the domains (broadening participation, STEM and computer science disciplines, and technological innovations) does the session address?
2) How have these intersections been identified, emerged, or evolved in your work?
3) What are the opportunities and challenges at these points of intersection?
4) How do you capitalize on these opportunities and resolve the challenges?
5) What are key insights or lessons learned from addressing these opportunities and challenges?
6) What are key issues that could inform a synthesis in this thematic area?

We also invite sessions that address project design, implementation, and dissemination (e.g., issues related to methodology, measurement, dissemination, partnerships, sustainability, or scale-up). DRK–12 and STEM+C awardees have a great wealth of experience related to promising (as well as less than promising) approaches in these areas.

Awardees are invited to submit proposals within the following 1.5 hour session formats:

- *Roundtable Discussion Session*
  Roundtable discussions support idea exchange and networking. Proposals to facilitate informal discussions should identify the guiding question(s), common challenge(s), or topic focus, as well as one or two discussion facilitators.

- *Topical Session*
  Topical sessions provide multiple perspectives on specific aspects of the theme, approaches to common challenges in DRK–12 work and research, and/or responses to a question that might inform other projects. Topical sessions should involve the collaboration between multiple projects to develop topics, lead sessions, and facilitate discussion.

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[3] The 2018 DRK–12 PI Meeting Committee and advisors include Jodi Asbell-Clarke, Ximena Dominguez, Chad Dorsey, Christian Doubler, Joni Falk, Dana Grosser-Clarkson, Daniel Heck, Benjamin Kelcey, Eric Klopfer, Okhee Lee, Joyce Maylen-Smith, and Sharon Lynch.

- *Structured Poster Session*

  Structured poster sessions usually involve five (5) or more projects, allow participants to view posters of the presenting projects, and include a panel and/or discussion. (*Please note that all projects are invited to present a poster in the general Poster Hall—registration for the general Poster Hall will open later this spring; however, projects participating in structured poster sessions are not expected to participate in the general poster session unless they choose to do so.*)

- *Technical Assistance Session*

  Technical assistance sessions provide knowledge and skill building to session participants. A single presenter or multiple presenters may share technical, conceptual, and/or methodological innovations and expertise.

- *Working Session*

  Working sessions are focused on engaging small groups of participants in producing a concrete deliverable. As an example, a working session might produce an outline for a synthesis study by documenting the literature, theories, and perspectives that different projects are building on, identifying the areas in which projects are contributing, and articulating questions that still need to be addressed.

Proposal Submission Instructions

Please submit your proposal online by March 13, 2018. Since you will not be able to return to the site and edit your submission, we suggest that you collect the required information ahead of time—using the template as a guide—and transfer the information to the survey when ready.

Proposals should include the following:
- Presenter(s) information* (i.e., name, organization, contact information, project title)
- Session title
- Session format
- Question or issue that is the primary focus of the session
- Thematic intersection(s) addressed
- STEM and computer science discipline(s) or technological innovation(s)
- Grade band(s) or grade level(s)
- Target audience(s) (e.g., students, teachers, formal, informal, urban, suburban)
- Emphasis on teaching, learning, and/or assessment
- Session summary (limited to 25 words)
- Session description (approximately 250 words, no graphics): Include how the session addresses the theme/topic, objectives, structure/format, plan for interaction with the participants of the session, and expected outcomes. Proposals that do not define a specific plan for participant engagement will not be considered.

*Lead presenters must be awardees invited to and registered for the 2018 DRK–12 PI Meeting. Each presenter is allowed to lead only one session but may be a co-presenter on more than one session.

Review Process

Proposals will be reviewed by the PI Meeting Committee and CADRE staff. The final agenda will combine sessions and interactions that are varied in structure and content. If a session is chosen for inclusion in the meeting, the session contact person will be notified in April–earlier if revisions are suggested.

Criteria for selection follow:
- Responsiveness to the theme
- A complete proposal (i.e., containing all relevant elements outlined in Proposal Submission Instructions above)
- Effective plan to engage participants in discourse and/or activity that has the potential to benefit the session participants and those not in attendance, such as when a product is developed, new ideas are generated and documented, and materials are shared.
- Potential to generate new insights or research directions for the DRK–12 and STEM+C communities as well as NSF at large.

Additional Information
- CADRE encourages grantees to coordinate sessions with colleagues across institutions and projects. For those interested in finding colleagues engaged in work that may, when paired together, create the basis for a compelling session, we have included a list of projects invited to the meeting and encourage you to visit CADREK12.org to learn more about their awards. You may also contact cadre@edc.org for information about possible matching projects.
- Most of the concurrent sessions will be scheduled for June 7, with some additional sessions (mostly roundtable discussion and working sessions) scheduled for June 8.
- Each meeting room will be set up in rounds and have a projector and screen. Laptops, extension cords, and speakers will not be available unless specifically requested.
- All presenters must submit their presentation materials to CADRE prior to the meeting. Presentation materials will be posted on CADREK12.org.
- More information about presenter responsibilities, subsequent deadlines, and session logistics will be sent to those whose proposals are accepted.

SUBMIT NOW
Deadline is March 13, 2018

QUESTIONS? Email cadre@edc.org