NATIONAL SCIENCE FOUNDATION
2415 EISENHOWER AVENUE
ALEXANDRIA, VIRGINIA 22314

NSF 22-085

Dear Colleague Letter: Mid-Scale Research Infrastructure Incubators and Conferences for STEM Education Research with a Focus on Education Equity

May 11, 2022

Dear Colleagues:

With this Dear Colleague Letter (DCL), the National Science Foundation's (NSF) Directorate for Education and Human Resources (EHR) notifies the community of a collaboration with the Bill & Melinda Gates Foundation, Schmidt Futures, and the Walton Family Foundation to offer Incubator and Conference proposal opportunities that support the development of Mid-Scale Research Infrastructure (RI) efforts, especially those that enable research on the assets and needs of those traditionally left out of STEM and that lead to greater education equity. Mid-Scale RI is a relatively new concept for the science, technology, engineering, and mathematics (STEM) education community because STEM education research has traditionally been distributed, individual, and less reliant on instrumentation. Improving the speed and scale at which STEM education research advances, however, requires national research infrastructures. Through this DCL, NSF aims to conceptualize and consolidate viable infrastructure ideas to support STEM education research that will transform teaching and learning.

This DCL establishes an opportunity for the field to incubate Mid-Scale RI ideas in STEM education, allowing for idea progression through conception and planning, and placing potential PIs on a path to develop future Mid-Scale RI proposals. As one of NSF's Big Ideas, the NSF-wide Mid-Scale RI initiative is designed to support the implementation of research capabilities with total project costs between $6M and $100M. These projects directly enable advances in fundamental STEM in one or more of the research and education domains supported by the NSF (see previous solicitations NSF 21-505 and NSF 21-537).

Mid-Scale RI Incubators and Conferences are designed to link researchers, educators, communities, non-profits, for-profits, governments, and industry to develop ideas around field-identified infrastructure needs and concepts that will transform STEM education research,

particularly at the preK-12 level. These awards provide resources to convene partners, establish collaborative mechanisms, and develop innovative plans for enduring infrastructure resources that would significantly impact education research at speed and scale, with a special focus on supporting the learning needs of students whose talents, intelligence, and entrepreneurship have been historically unrecognized and underused in the nation's STEM enterprise.

Proposals for Mid-Scale RI Incubators and Conferences should identify national STEM education research infrastructure gaps. Infrastructure may include any combination of facilities, equipment, instrumentation, data repositories, or computational hardware or software, along with the necessary human capital to support it. NSF particularly encourages proposals that reflect infrastructure for integrative research, tangible research capacity building, meaningful community engagement, and efforts to advance STEM education. Proposals are encouraged to be clear in the ways they will incorporate the voice of those in the community most impacted by historical education inequities. While there is particular interest in projects that focus on the preK-12 level, connections to postsecondary education and/or informal learning are welcome.

Ensuring accessibility and inclusivity, identified as one of the three pillars of the NSF vision, is a priority area for the Foundation. Mid-Scale RI Incubator and Conference proposals are strongly encouraged to incorporate specific diversity, equity, inclusion, and access goals in their STEM education research infrastructure plans. All proposals should develop plans for effective student training and the involvement of a diverse workforce in instrumentation, facility development, or data management/analysis.

INCUBATORS

Mid-Scale RI Incubators will develop the groundwork for future Mid-Scale RI proposals in STEM education research. Incubator proposals should show clear potential to develop novel, leading-edge research infrastructure ideas and should address important STEM education challenges, build significant education research opportunities, and engage STEM education community stakeholders while protecting student privacy. Incubator awards will help teams carry out limited preliminary activities that prepare identified infrastructure projects with strong scientific merit. Incubator proposals should clearly identify the primary scientific and technical requirements, design, and specifications of the research infrastructure as well as outline the ways that student privacy is protected. They should also articulate preliminary plans to execute and manage the intended Mid-Scale RI, including risk identification and mitigation plans, a governance plan, and effective project management methods for tracking progress, costs, and performance. Mid-Scale RI Incubators will be structured as Research Coordination Networks (RCNs). Incubator proposals should be prepared in accordance with the guidance contained in the RCN solicitation (NSF 17-594) and the *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) or the *NSF Grants.gov Application Guide*. Although the RCN

solicitation states that award duration may be up to 5 years, Mid-Scale RI Incubators should request up to 2 years of funding with maximum budgets of $500,000. Mid-Scale RI Incubator proposals will be evaluated using multidisciplinary panels and, when needed, selected ad hoc reviews.

CONFERENCES

This DCL also offers the opportunity for conference proposals that will bring together communities at the beginning of the Mid-Scale RI conceptualization phase. Each conference proposal should clearly describe the potential of the conference to identify broader research infrastructure needs that would benefit the U.S. STEM education research community. Conferences should support a diverse set of 20 to 50 attendees. Attendees could include STEM education researchers, practitioners, and students, as well as preK-12 educators, education administrators, potential users of the proposed infrastructure, and policy makers at federal agencies, industry, and non-profits. Conferences are encouraged to include individuals with experience in the management of research infrastructure at this scale. Proposals should include the deliverable of a report to the community that addresses the identified gap(s) in research infrastructure and outlines a strategy for access to and use of the infrastructure by STEM education researchers and other communities. The report should position the relevant communities to respond to future opportunities for research infrastructure projects. Organizers are encouraged to explore various formats for their proposed conference to engage diverse stakeholders most effectively. For information about preparing and submitting conference proposals, please see PAPPG Chapter II.E.9.

Proposals received by NSF will be evaluated according to the standard NSF merit review criteria of intellectual merit and broader impacts. Relevant information about the proposals which are under consideration for funding, along with the corresponding unattributed review and/or panel summaries, may be shared with representatives from the Bill & Melinda Gates Foundation, Schmidt Futures, and the Walton Family Foundation as appropriate.

As an important reminder, proposed infrastructure ideas in conference and incubator grants should not:

- solely focus on center or small-scale laboratory development or acquisition of collections of instruments,
- have a user-base that is largely restricted to one campus or a single local community.

Finally, Mid-Scale RI Incubator or Conference proposals do not constitute any commitment on behalf of the submitters or their institutions to submit a proposal or carry out a research infrastructure project, nor do they imply an intent on the part of NSF to support a proposed Mid-Scale RI project.

SUBMITTING PROPOSALS

Prior to submitting a Mid-Scale RI Incubator or Conference proposal, the PI must send an email to edumidsc@nsf.gov to ensure that the proposal fits the goals of this DCL. PIs will then be directed to Program Director(s) with subject matter expertise most appropriate for the project for further consideration and to ascertain whether an incubator or conference proposal would be best matched to the desired goals and outcomes. Proposals or requests where PIs have not contacted the Program Director to whom they have been directed will be returned without review. Mid-Scale RI Incubator and Conference proposals should be submitted via Research.gov or Grants.gov.

As mentioned above, Mid-Scale RI Incubator proposals should follow proposal guidance in the RCN solicitation (NSF 17-594). Although the RCN solicitation states that award duration may be for up to 5 years, Mid-Scale RI Incubators should request up to 2 years of funding with maximum budgets of $500,000. Submit incubator proposals to the PAPPG and select the EHR Directorate, the appropriate EHR Division (e.g., DGE, HRD, DRL, DUE) and then the EHR Core Research (ECR) Program. The target dates (by 5 p.m. local submitter's time) for incubator proposal submission are:

- **September 1, 2022**
- **March 1, 2023**

Mid-Scale RI Conference proposals should be submitted through the normal submission processes outlined in Chapter II.E.9 of the NSF PAPPG. Submit conference proposals to the PAPPG and select the EHR Directorate, the appropriate EHR Division (e.g., DGE, HRD, DRL, DUE) and then the EHR Core Research (ECR) Program. The budget for conferences is generally limited to $50,000 but under exceptional circumstances may be supported up to $99,000. The target date for conference proposal submission is **July 1, 2022, 5 p.m. local submitter's time**. Proposals submitted by this date will be considered during Fiscal Year 2022.

Inquiries or questions about this DCL and submission of proposals in response to it should be directed to edumidsc@nsf.gov, not to individual Program Directors.

PROGRAM DIRECTORS

- Xiufeng Liu, Division of Research on Learning, Directorate for Education and Human Resources
- Jill K. Nelson, Division of Undergraduate Education, Directorate for Education and Human Resources
- Jessaca Spybrook, Division of Research on Learning, Directorate for Education and Human Resources

NSF will conduct two webinars to answer questions about this DCL. Register in advance for these webinars:

May 26, 2022, 03:00 - 04:00 PM Eastern Time (US and Canada)
https://nsf.zoomgov.com/webinar/register/WN_wsde2TuLT-GRFeybfue4AQ

June 14, 2022, 03:00 - 04:00 PM Eastern Time (US and Canada)
https://nsf.zoomgov.com/webinar/register/WN_z3K-4n9QQluBQQ6LQEEUbQ

After registering, you will receive a confirmation email containing information about joining the webinar.

Sincerely,

Sylvia M. Butterfield
Assistant Director (Acting)
Directorate for Education and Human Resources