NATIONAL SCIENCE FOUNDATION
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ARLINGTON, VIRGINIA 22230

NSF 16-064

Dear Colleague Letter: Fundamental Research to Improve STEM Teaching and Learning, and Workforce Development for Persons with Disabilities within the EHR Core Research Program

April 5, 2016

Dear Colleagues:

The National Science Foundation's (NSF) Directorate for Education and Human Resources (EHR) wishes to notify the community of their intention to support fundamental research on STEM learning for persons with disabilities, such as dyslexia or autism. The NSF intends to foster efforts to develop foundational knowledge in STEM teaching and learning for persons with disabilities in both formal and informal contexts from the earliest developmental stages of life through participation in the workforce. This notification is in relation to research on broadening participation in STEM emphasis area of Program Announcement NSF 15-509, EHR Core Research (ECR): Fundamental Research in Science, Technology, Engineering, and Mathematics (STEM) Education.

With this DCL, NSF invites proposals focused explicitly on advancing knowledge about STEM teaching and learning, and workforce development, for individuals with disabilities. *Research in disabilities education* includes fundamental research about learners (of all ages) with disabilities in STEM, with a particular focus on efforts to understand and address disability-based differences in STEM education and workforce participation. Proposers are encouraged to explore a wide range of fundamental and applied research projects that may address, but are not limited to, such areas as:

- The cognitive and neurological underpinnings of mathematics learning disabilities (such as attention, working memory, spatial reasoning, or executive function) in the context of STEM education and/or employment;
- Advancing foundational theoretical constructs about self-regulated learning (such as metacognition, strategic action, learning motivation, and self-efficacy) involving students with disabilities in STEM;
- The promise of computer and on-line training programs for improving mathematics learning and performance for students with dyslexia and other specific learning disabilities;
- Investigating developmental trajectories of persons with specific learning disabilities, or other types of disabilities, such as dyslexia or autism, in STEM education and professional disciplines over time;
- Studying the efficacy of STEM instructional strategies for persons with disabilities;
- Studying instructional practices for young students with disabilities who are not responsive to typical mathematics and/or science classroom instruction;
- Examining the auditory processing and learning mechanisms employed by students with visual impairments, and/or visual processing learning mechanisms by students who are Deaf or hard of hearing, in the context of learning science;
- The development of STEM measures that support valid and reliable observations (e.g., progress monitoring tools or dynamic assessments);

The stereotype and identity threat persons with disabilities experience in STEM classrooms, research settings, and workplaces;
- The societal and organizational characteristics that influence STEM learning, educational, and career pathways for students with specific types of disabilities;
- Improving STEM outcomes for individuals with specific learning disabilities, including dyslexia.

As described in the ECR program announcement, a wide range of research activities may be supported, including those identified by P.L. 114-124, the Research Excellence and Advancements for Dyslexia Act. Fundamental research can involve the collection of new data and/or secondary analyses that leverage extant state, national, international or other databases. Three levels of funding are available and should align with the maturity of the proposed work, the size and scope of the empirical effort, as well as the capacity of the interdisciplinary team to conduct the proposed research: (1) **Level I proposals**: have a maximum award size of $500,000 and a maximum duration of 3 years; (2) **Level II proposals** have a maximum total award size of $1,500,000 and a maximum duration of 3 years; (3) **Level III proposals** have a maximum award size of $2,500,000 and a maximum duration of 5 years.

In addition, NSF is interested in supporting capacity building proposals through synthesis projects and conferences and workshops related to advancing research and understanding of individuals with disabilities in STEM disciplines. **Synthesis** proposals seek support for the synthesis and/or meta-analysis of existing knowledge on a topic of critical importance to STEM learning and/or education, or for the diffusion of research-based knowledge. Examples of syntheses in this area could include the clarification of the current status of research relative to cognition and math learning disabilities or clarifying identification and screening procedures for dyscalculia and math learning disabilities. Investigators are encouraged to propose workshops and other meetings as one of the means of completing the syntheses and diffusing the research-based knowledge that is developed. Additional emphasis will be placed on the proposed dissemination plan. Maximum award size for Synthesis proposals is $300,000 (total) for duration of up to two years. **Conference** proposals seek support to conduct well-focused conferences or workshops related to the research goals of the program.

The deadline for submission of proposals to ECR is September 8, 2016. The NSF also strongly encourages early career faculty to submit proposals. Submissions should follow the NSF's Grant Proposal Guide (GPG).

Principal investigators interested in submitting proposals (or with other questions pertaining to this DCL) may contact one of the program directors:

- Mark Leddy, EHR/HRD, Program Director, mleddy@nsf.gov;
- Rob Ochsendorf, EHR/DRL, Program Director, rochsend@nsf.gov;
- Finbarr Sloane, EHR/DRL, Program Director, fsloane@nsf.gov.