



**NATIONAL SCIENCE FOUNDATION**  
**2415 EISENHOWER AVENUE**  
**ALEXANDRIA, VIRGINIA 22314**

**NSF 23-115**

## **Dear Colleague Letter: Advancing Microelectronics Education**

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May 22, 2023

Dear Colleague:

This Dear Colleague Letter (DCL) encourages submission of education proposals in all settings, both formal and informal, that will excite, motivate, and prepare students for participation in the microelectronics industry of the future in response to the CHIPS and Science Act of 2022 (CHIPS Act).

### **BACKGROUND**

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Microchips (aka “microelectronic integrated circuits”) are, in many ways, the lifeblood of the modern economy of the United States (US). The worldwide demand for microchips has increased exponentially since the COVID pandemic, causing supply-chain disruptions and resulting in global shortages of everyday goods. To address the microchip shortage, US-based leaders in chip-manufacturing technology plan to ramp up domestic production of chips, many of which are currently designed and manufactured by non-US based companies. Boosting domestic chip manufacturing can reduce supply risks, promote advanced manufacturing, improve the microchip manufacturing industrial base, create and fill new jobs, and provide enduring economic and national security benefits.

Reasserting US leadership in microelectronics will require the nation to train and engage a well-prepared workforce. NSF has funded microelectronics research and education since the 1950s, providing support for thousands of undergraduate and graduate students, post-docs, and early-career researchers. Now NSF intends to go even further by supporting projects to educate students and other learners in microelectronics, starting at the K-12 level and extending through undergraduate and graduate levels of study, spanning informal and formal educational settings. NSF expects that these projects will not only help students and the community develop the interest and motivation to engage in microelectronics, but also the creativity and vision leading to improvements in educational practices that would have broad social, economic, and scientific impact and benefits to the country.

## CALL FOR PROPOSALS

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NSF is accepting proposals to conduct education-related research and development to prepare a diverse microelectronics workforce beginning with the early preparation of K-12 students in and outside of school settings and extending through undergraduate, graduate and other levels of adult learning. This DCL encourages proposals that will inspire, study and support learners' interest and motivation to pursue education pathways and careers in microelectronics. Successful projects should engage students and learners in activities that will build knowledge and skills in science, technology, engineering, and mathematics (STEM) needed for the microelectronics workforce of the future. The Directorate for STEM Education (EDU) encourages the education research community to respond to this challenge through existing funding opportunities in EDU listed at the end of this DCL. Note that these proposals must meet all of the requirements of the corresponding funding program solicitations, including applicable deadlines and budget guidelines.

As appropriate, proposals may address learning in formal and informal environments, including but not limited to research and development of microelectronics curricula, exhibits and programs at science centers, educational approaches to expand equity and opportunity, student internships, graduate traineeships, and educator professional development. The needs of important stakeholders, such as industry professionals and professional societies may also be addressed. It is imperative that the microelectronics industry of the future be founded on principles of inclusivity that ensure equitable access to new careers. Thus, this DCL encourages all proposals to include educational approaches designed to broaden participation in microelectronics and related careers. Proposals can build from the perspectives and strengths of talent pools that have not yet been fully tapped. The program encourages the participation of the full spectrum of diverse talents in STEM.

## TYPES OF ACCEPTED PROJECTS

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With this DCL, the National Science Foundation's (NSF) Directorate for STEM Education invites the submission of standard Research proposals, EARly-concept Grants for Exploratory Research (EAGER) proposals or Supplemental Funding Requests to existing awards.

**Standard Research Proposals:** Research proposals should be submitted to the relevant program by the program's annual submission due date. Please read the solicitation for the prospective program carefully. Proposers are strongly encouraged to contact, by email at [edu\\_chips@nsf.gov](mailto:edu_chips@nsf.gov), a program officer managing the NSF program with which the research and/or education would be aligned to discuss the fit of ideas to funding opportunities.

**EAGER Proposals:** EAGERS are described in Chapter II.F.3 of the *NSF Proposal & Award Policies & Procedures Guide* ([PAPPG](#)): Per the PAPPG, the submission of EAGER proposals is by invitation only; the process is initiated by the submission of a Concept Outline describing

the proposed high-risk / high-reward project that addresses the opportunity. The Concept Outline must clearly describe the idea with a clear explanation of why it is exploratory, potentially transformative, or otherwise potentially impactful. All correspondence, inquiries and Concept Outlines must be submitted via email to [edu\\_chips@nsf.gov](mailto:edu_chips@nsf.gov).

**Supplemental Funding Requests to Active Awards:** Supplemental funding requests must be in one of the programs listed below and should not exceed 20% of the original award size or \$200,000, whichever is smaller. Supplemental funding requests should be submitted to the original program associated with the active research award. Each supplemental funding request must follow the guidance specified in PAPPG Chapter VI.E.5. After the submission of their supplemental funding request, PIs should alert the cognizant program officers by sending an email to [edu\\_chips@nsf.gov](mailto:edu_chips@nsf.gov) with the number assigned to the supplemental funding request.

Questions about this DCL should be directed to [edu\\_chips@nsf.gov](mailto:edu_chips@nsf.gov)

Sincerely,

James Moore  
Assistant Director, EDU

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Proposals are particularly encouraged in the following programs:

- [Advanced Technological Education Program \(ATE\)](#)
- [Advancing Informal STEM Learning \(AISL\)](#)
- [Computer Science for All \(CSforAll: Research and RPPs\)](#)
- [Discovery Research PreK-12 \(DRK-12\)](#)
- [Improving Undergraduate STEM Education: Hispanic Serving Institutions \(HSI\) Program](#)
- [Improving Undergraduate STEM Education Program \(IUSE\)](#)
- [Innovative Technology Experiences for Students and Teachers \(ITEST\)](#)
- [NSF's Eddie Bernice Johnson INCLUDES Initiative](#)
- [NSF Research Traineeship \(NRT\) Program](#)
- [Robert Noyce Teacher Scholarship Program \(NOYCE\)](#)

Proposals are also welcome in the following programs:

- [EHR Core Research \(ECR\)](#)
- [Historically Black Colleges and Universities - Undergraduate Program \(HBCU-UP\)](#)
- [Innovations in Graduate Education \(IGE\) Program](#)
- [Scholarships in STEM Program \(S-STEM\)](#)

## The Louis Stokes Alliances for Minority Participation (LSAMP)

*(Note: For standard research proposals submitted in FY2024. LSAMP is an alliance-based program. Projects must be alliance or partnership-based. Community colleges are encouraged to propose. Funding limitations apply. Bridge to the Doctorate awardees may submit requests for supplemental funding only in alignment with this DCL.).*