

**Early-Phase Competition Absolute Priority 3 (STEM)
MK Level Playing Field Institute (dba SMASH)
S411C230113**

SMASH 3.0: Innovations in Programming Strategies that Promote Equity in Computer Science Pathways for Historically-Excluded Students

Applicant Name: MK Level Playing Field Institute dba SMASH

Project Title: SMASH 3.0: Innovations in Programming Strategies that Promote Equity in Computer Science Pathways for Historically-Excluded Students

Type of Grant Requested: (select one) Early-Phase Mid-Phase Expansion

Absolute Priorities the Project Addresses: (select all that apply)

Absolute Priority 1-- Demonstrate a Rationale (Early), Moderate (Mid), Strong (Expansion)

Absolute Priority 2-- Field-Initiated Innovations—General

Absolute Priority 3-- Promoting STEM Education

Absolute Priority 4-- Meeting Student Social, Emotional, and Academic Needs

Absolute Priority 5-- Educator Recruitment and Retention

Competitive Preference Priorities the Project Addresses: (select all that apply)

Competitive Preference Priority 1— Promoting Equity in Student Access to Educational Resources and Opportunities: Implementers and Partners

Competitive Preference Priority 2—Supporting a Diverse Educator Workforce and Professional Growth to Strengthen Student Learning* (FOR EARLY-PHASE AP5 APPLICANTS ONLY)

Total number of students to be served by the project: 600

Grade level(s) to be served by the project: 11th, 12th

Definition of high-need students: Student identities underrepresented in the computing field will be prioritized in the selection process (e.g., Black, Latine, Native, low-income, girls, non-binary).

Brief description of project activities: SMASH 3.0 is a culturally-responsive CS exposure program that prepares marginalized students to engage with a CS path. It includes the following key components: (1) an introductory CS course, (2) CS project-based learning activities tied to conversations about the ethics of tech-enabled solutions, (3) social-emotional workshops, (4) networking with peers, computing professionals, and faculty, and (5) access to a digital platform with resources to navigate colleges and careers in CS.

Summary of project objectives and expected outcomes: SMASH 3.0 aims to have marginalized students persist in CS by increasing their: (1) awareness about pursuing a CS major and career; (2) confidence to pursue a CS pathway; (3) motivation to explore CS beyond the program; (4) knowledge of navigating the college application process towards a CS pathway; (5) connections to peers on a CS pathway and professionals in the CS industry; (6) enrollment in CS courses.

Summary of how the project is innovative: The proposed project brings forward an integrated in-person and tech-enabled solution to address barriers on the computing pathway. The in-person summer residential component focuses on CS exposure, peer network building with students on CS pathways who have shared identities, exposure to CS professionals, and social-emotional learning to engage students in CS on university settings. To sustain that motivation beyond the intensive 3-week period requires a tech-enabled solution via a digital platform. Students will access the platform to expand their knowledge of computing role models aligned to their interests and in emerging CS areas (e.g., AI). The platform will also serve as a resource repository for additional CS exposure opportunities, postsecondary CS departments/institutions, and internship opportunities.

Other studies related to the proposed project: The proposed project derives its key components from research-based interventions, including National Academies of Sciences, Engineering, and Medicine.

(2021). *Cultivating Interest and Competencies in Computing: Authentic Experiences and Design Factors*. Washington, DC: The National Academies Press.; Goode, J., & Margolis, J. (2011).

Exploring computer science: A case study of school reform. *ACM Transactions on Computing Education (TOCE)*, 11(2), 1-16.; Wang, J., Hong, H., Ravitz, J., & Ivory, M. (2015). Gender differences in factors

influencing pursuit of computer science and related fields. In *Proceedings of the 2015 ACM Conference on Innovation and Technology in Computer Science Education* (pp. 117-122).;

Steinke, J., Applegate, B., Penny, J. R., & Merlino, S. (2021). Effects of diverse STEM role model videos in promoting adolescents' identification. *International Journal of Science and Mathematics Education*, 1-22.

Proposed implementation sites: 5 university sites in Georgia, Massachusetts, California, and Michigan

Organizations partnering with this project: Kapor Foundation will be collaborating on the project's program implementation. Morehouse College, Northeastern University, Spelman College, University of California-Berkeley, and the University of Michigan will be the project's university sites. American