

Scaling, Supporting, and Sustaining Libraries as Community Hubs for Citizen Science (SSSL)

Arizona State University (ASU), along with SciStarter, Arizona State Library, the National Informal STEM Education Network (NISE Net), and additional library and science museum partners, proposes a National Leadership project grant proposal, *Scaling, Supporting, and Sustaining Libraries as Community Hubs for Citizen Science* (SSSL). The \$600,000 project will build on our current work in Arizona (“Libraries as Community Hubs for Citizen Science”) to 1) adapt, scale, and promote a field-tested, replicable suite of citizen science (“citsci”) resources for libraries nationwide, 2) support a growing network of citsci librarians to share resources and best practices for citsci in libraries, and 3) provide access to and support for the citsci kits. The goal is to mature, scale, and sustain our state-wide project--prioritizing engagement of participants from diverse backgrounds--to make a national impact on libraries in support of lifelong learning.

The project will be guided by the inclusive practices at ASU “to measure impact not by whom we exclude, but rather by whom we include and how they succeed”. Leveraging the complementary expertise of libraries (access to resources, including lending physical STEM kits), museums (lifelong STEM learning experts), SciStarter (a public-facing resource and research platform facilitating meaningful engagement in science), and university faculty (experts in citsci, lifelong learning, and community engagement), the project team will work with citsci practitioners, evaluators, STEM educators, diversity experts, and others to: 1) adapt, scale and promote physical and digital citsci toolkits and supporting resources that can be accessed through libraries; 2) develop resources to train, support, and communicate with librarians and volunteer researchers from diverse populations; and 3) work with stakeholders to implement a sustainable model nationwide through the State Library Agencies (SLA), the National Network of Libraries of Medicine (NNLM), our proposed cost sharing partners (the Sloan and Moore Foundations), and other potential sources [Eberhart]. **The proposed project, informed by analysis and evaluation** of our current IMLS-supported project in AZ, **will improve services and resources and enable libraries to provide opportunities for deeper engagement in authentic STEM learning**. This project also addresses critical barriers in citsci infrastructure, including lack of awareness of citizen science and lack of access to necessary instruments, which prohibits broad participation.

1. STATEMENT OF NATIONAL NEED: Libraries play an essential role in reaching the public, inspiring STEM interest, and supporting STEM skills [Hildreth]. Citsci is a fast-growing field that engages the public in scientific inquiry in need of their help, through data collection and analysis, and provides a variety of authentic lifelong learning opportunities for diverse participants. SciStarter features thousands of citsci opportunities for all ages, across a wide range of topics with varying requirements for equipment and time. Evaluation of our current project in AZ (UOEEE, in preparation) showed **patrons reported increased awareness, interest, and knowledge of citsci and confidence in their ability to collect and interpret data and 92% said they would check out another citsci kit**. Results suggest that communities *are* learning and benefiting from the AZ project. Librarians felt comfortable assisting patrons with the citsci kits (tools and projects to monitor water and air quality, document nature, measure light pollution and more) and reported the program would benefit greatly from additional promotions and resources to better engage diverse communities. Several other states have expressed interest in adopting the citsci kits and resources. SSSL will build on our project in AZ [IMLS #LG-95-17-0158-17] and related projects by the project team, including SciStarter 2.0: A Dashboard to Drive Research, Participation, and Community-building in Citizen Science (NSF #1516703) and Exploring a Taxonomy for CitSci Tools Database (NSF #1644554).

2. PROJECT DESIGN: SSSL is a three-year project with three primary phases. Phase 1: Nov 2020-Oct 2021. Coordinate a network of citsci librarians to facilitate information sharing; pursue library organizations and foundations to coordinate RFPs in support of citsci kits for libraries; convene a meeting of librarians and community leaders at the May 2021 Citizen Science Association (CSA) conference at ASU to improve our current resources and programming. CSA's Equity, Inclusion and Diversity working group and the project team will select participants. Customize a SciStarter microsite for open access to the materials, best practices, projects and kits as well as step-by-step instructions for patrons to engage in projects, share/analyze data, and leave feedback about the kits. Formative evaluation will focus on the usability and utility of these resources. Phase 2: Nov 2021-Oct 2022. Iterate, produce, and make kits and materials available on SciStarter via a Build (download or purchase materials to create your own kit), Borrow (find a participating library), Buy (purchase out-of-the-box from our vendor) feature. Host monthly calls to support librarians and stakeholders and exchange knowledge. Formative evaluation will measure the efficacy of participant engagement and learning. Summative evaluation will measure adoption rate, particularly among libraries serving diverse audiences. Phase 3: Nov 2022- Oct 2023. Expand the network of librarians offering citsci kits and programs, promote expansion, and broadly disseminate results through STARnet and SciStarter. Summative evaluation will focus on participants' learning, engagement, and sense of self-efficacy resulting from their participation in the projects.

The project team is well positioned to adapt and scale a sustainable model nationwide. The project will be directed by Darlene Cavalier, MA, professor of practice at ASU and founder of SciStarter, a nationally recognized expert in citsci, and Dan Stanton, MA, associate librarian at ASU and past president of Arizona Library Association who co-led related projects. The team also includes Rae Ostman, PhD, associate research professor at ASU and director of the NISE Network. Additional staff and project advisors include Chris Guerra (Arizona State Library), Cynthia Randall (Cornerstones for Science), Paul Dusenbury (STARnet) and experts in equity, diversity, and inclusion. The University Office of Evaluation and Educational Effectiveness (UOEEE) will lead evaluations through qualitative and quantitative data collection and analysis.

3. DIVERSITY PLAN: Our work will be informed by advisors at ASU's Office of Diversity and CSA's Working Group on Equity, Diversity, and Inclusion.

4. NATIONAL IMPACT: SSSL will leverage our understanding of how libraries can support lifelong STEM learning through citsci; enhance physical and digital resources designed to reach and engage diverse audiences across the nation; provide turnkey solutions for scientists in need of data and observations from participants; and support a network of citsci librarians to share best practices and surface support to sustain the program.

BUDGET: The total project is budgeted at \$1,199,984. The current proposal budget for IMLS support is \$599,992 including \$109,982 for salaries and wages, \$29,052 for fringe benefits, \$22,000 for travel, \$25,000 for participant support, \$15,000 for materials, \$174,275 for contracts and consulting services, \$25,008 for tuition remission, and \$199,676 for indirect costs. The Sloane and Moore Foundations have indicated strong interest in providing an overall equivalent amount of cost-share support.

REFERENCES CITED: UOEEE (in preparation). *Libraries as Community Hubs for Citizen Science: Summative Evaluation Report*. Tempe, AZ: Arizona State University.

Eberhart, George (2019). *Citizen Science: How librarians can energize their patrons to advance science*.

<https://americanlibrariesmagazine.org/blogs/the-scoop/citizen-science/>

Hildreth, Susan (2014). *A Comprehensive Strategy to Strengthen STEM Learning Must Include Libraries and Museums*, blog post on informal.science.org.