Overview
This *Innovations in Development* project will create *The Circuit:* a distributed mobile and web-based platform that connects the public offerings of otherwise separate public engagement in science (PES) networks, including SciStarter, the Science Festival Alliance, the Association of Science-Technology Centers and the Connectory, with Informal STEM Learning (ISL) researchers from Oregon State University and COSI Columbus. The resulting distributed, digital platform will empower publics to discover a broad spectrum of opportunities to participate in science, all while collecting data that reveals patterns of engagement towards understanding factors of influence *between* different types of experiences. *The Circuit* affords a critical mass of involvement by the publics and institutions. For the data to be accessible to ISL researchers, custom development is required.

One model for this effort is *SciStarter,* an existing online platform that connects the public to citizen science projects. *SciStarter* has made possible the collection and organization of thousands of citizen science projects that would otherwise be scattered across the web. It also allows participants to track their own activity and receive referrals to other citizen science projects. These interfaces are customizable, so *SciStarter's* national collaborators are able to present them on their own websites with their own branding. Importantly, *SciStarter* allows the tracking of patterns of engagement across citizen science projects, a feature that is now facilitating original ISL research (including a current NSF-funded investigation).

The emerging yet rapid adoption of *SciStarter* by public audiences, practitioners, and ISL researchers signals *The Circuit's* potential. *The Circuit* will dramatically build on *SciStarter's* technical achievements in the citizen science sector, while systematically encompassing the offerings of additional sectors. Established national networks of science centers, science festivals, and afterschool programs will help *The Circuit* develop tools to make the most of each sectors' offerings, while guaranteeing access to a variety of public audiences and researchers. *The Circuit* will use 10 regions to test the integration of offerings and the viability of the platform to support future ISL research. Small-scale pilot research programs will be tested, with lessons learned worked into its iterative design.

Intellectual Merit
The Circuit is the first project that builds on two key new aspects of innovation in informal STEM learning and the public engagement with science: online platforms that broker connections between those offering activities in ISL and potential audiences, and the concept of STEM learning ecosystems, i.e., the notion that individuals are embedded in a web of potentially connected opportunity to integrate their informal and formal STEM learning. The Intellectual Merit of *The Circuit* is that it will connect STEM engagement and learning opportunities across ISL domains, and by doing so create the first system that allows for comprehensive behavioral-based research on how learners connect experiences between domains. Requiring volunteer participation, *The Circuit* will explore the geographic and demographic patterns of participants in the system, and derive important design lessons for its own and future efforts to create curated systems of connected learning across STEM education in informal settings.

Broader Impacts
The Circuit will leverage the reach of its trusted network, including outreach to Discover's three million monthly online readers. Designed for adults and families, it will afford unrivaled opportunities to move participants from one role (doing, learning, and using science) to another (sustained public engagement in research, education, and decision-making). The platform will be tested through research and evaluation with results published widely. Tools will be automated and opened to aid in sustaining and scaling to broader implementation in service of larger and more diverse ISL audiences, offerings, and research.