

Sponsor/Title: National Science Foundation (NSF) -- Test Bed: Toward a Network of Programmable Cloud Laboratories (PCL Test Bed)

Website:

<https://www.nsf.gov/funding/opportunities/pcl-test-bed-test-bed-toward-network-programmable-cloud-laboratories/nsf25-541/solicitation>

Funding Opportunity Number: NSF 25-541

Notre Dame Limited Submissions Listing:

<https://research.nd.edu/our-services/funding-opportunities/faculty/limited-submissions-program/>

Focus: NSF's *Test Bed: Toward a Network of Programmable Cloud Laboratories (PCL Test Bed)* aims to advance autonomous, AI-enabled experimentation by funding 4–6 distributed lab nodes (PCL Nodes) at up to \$5M/year each for 4 years. These remotely accessible facilities will support programmable, high-throughput experimentation tied to clearly defined *science drivers*—such as materials science, chemistry, or biotechnology—and enable broader access to cutting-edge lab infrastructure across research and industry.

The program supports efforts to standardize lab workflows, data practices, and AI integration to improve reproducibility, accelerate discovery, and lower barriers to participation. For the current solicitation, only organizations with pre-existing instrument facilities are eligible to apply to this program to be a PCL Node. Proposals must include plans for user recruitment, workforce training, long-term sustainability, and collaboration across the PCL network.

Program Description:

The PCL Test Bed will establish a national network of automated, programmable laboratories that support:

- User-defined, remote experiments using standardized instruments and protocols;
- AI-driven, self-driving workflows that accelerate synthesis, testing, and analysis;
- Well-defined science drivers in areas like materials science, biotechnology, or chemical catalysis;
- Data sharing and metadata standards to improve interoperability and reproducibility;
- Recruitment and training of users, especially from under-resourced institutions;
- Security protocols and bioethics considerations for responsible experimentation.

PCL Nodes must provide technical staff for experiment support, data/AI assistance, and community onboarding. Proposals should detail plans for cross-node collaboration, post-award sustainability, and measurable scientific and societal impact.

Required Internal Application: Upload the following information to the Google Form -- <https://forms.gle/dqmGEsNmgaN7hkH27> by the internal deadline.

- Name of the Principal Investigator (PI)
- Project Title
- ND Collaborators

- For each ND Collaborator listed, include name, department or unit, and specific role for this project in three sentences (maximum).
- Project Summary: A four-page project summary (maximum) based on the NOFO Merit Review Criteria 1) Intellectual Merit and 2) Broader Impacts. Include in your summary: 1) a description of pre-existing instrument facilities that make the institution eligible for this opportunity, 2) plans for user recruitment, workforce training, long-term sustainability, and collaboration across the network and 3) a rough order of magnitude budget and budget justification. If references are included, they must be part of the four-page summary and not a separate document.

Internal Interest Date:

2025-08-27

Sponsor Deadline Date:

2025-11-20

Questions? Contact Notre Dame Research Limited Submissions at limited@nd.edu.

Unless otherwise noted, all internal applications are due by 11:59 PM Eastern Daylight Time on the internal expression of interest deadline.

Internal applications submitted after the deadline will not be accepted.