

Advanced Instrumentation Development Center (AIDC) in the Physical Science and Engineering Building (PSEB)

A vision from the Instrumentation Task Force and AIDC Committees

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Summary

Instrumentation development was identified as one of the key cross-cutting initiatives in Yale's 2018 [University Science Strategy report](#). In February 2020, Provost Strobel subsequently announced planning for the [Physical Science and Engineering Building \(PSEB\)](#).

Following the Yale Days of Instrumentation in [2018](#) and [2020](#) and as part of the initial PSEB planning process, Provost Strobel tasked an Instrumentation Task Force with considering how the university could provide new, innovative physical space and resources in support of instrumentation development at Yale. This task force formulated a plan for what is now envisioned as the Advanced Instrumentation Development Center (AIDC) within the PSEB. The AIDC's mission as a specialized hub of technical facilities is to facilitate cross-cutting ideation and innovation; and serve as a resource for engineering expertise, a physical space (or destination) for education and training programs, and a center for community-building efforts, connecting researchers and staff across campus.

The AIDC will be a destination for staff, researchers, and faculty engaged in developing instrumentation and advanced technologies, fostering interdisciplinary initiatives across campus and the broader community. With a broad user group composed of members with diverse interests, the AIDC will enable the realization of novel and cross-cutting ideation and fabrication activities across a variety of initiatives, including those in quantum science, planetary solutions, and beyond. For example, the AIDC plans to offer the opportunity to connect instrumentation solutions with the latest developments in data collection, high-performance computing, and data science, forming direct connections between hardware and analysis. This integration would uniquely position the AIDC in the context of other science initiatives on campus, increasing Yale's leadership at the nexus between hardware, computing, and data science.

Goals

To realize the vision outlined above, the AIDC plans to serve several specific programmatic goals:

- Expand technical support for instrumentation development on campus, building on the technical shops and the Advanced Prototyping Center at Wright Lab, and adding key capabilities, such as electronics and data acquisition support capabilities.
- Serve as a centralized instrumentation and engineering facility and intellectual "hub" for instrumentation development for the entire campus community.

- Build cross-cutting synergies between different disciplines and locations on campus and facilitate connections within the research and instrumentation development community, akin to those the [Center for Engineering and Innovative Design \(CEID\)](#) creates for our undergraduate students.
- Provide a framework to better organize, coordinate, and support instrumentation efforts on campus.
- Provide the Yale instrumentation community access to specialized expert advice and hands-on training opportunities in support of instrumentation development.
- Provide enhanced support, professional development, and career opportunities for professional staff scientists.
- Be a visible sign for world-class science at Yale.
- Facilitate the development of intellectual connections across and between disciplines and allow for expanded connection with Brookhaven National Laboratory and other industry partners.
- Support the continued evolution of scientific and technical work at Yale, facilitated by the development and deployment of advanced instrumentation, to help the University remain at the forefront of scientific discovery.

Capabilities, Cores, and Spaces

To support these programmatic goals, AIDC will plan to add key capabilities, cores, and specialized spaces to the landscape of research infrastructure at Yale, such as:

- An electronics development and data acquisition core
- Expansion of the prototyping capabilities in the Advanced Prototyping Center (APC)
- R&D and assembly spaces for instrumentation projects
- Interaction, seminar, and workshop spaces for an instrumentation development program
- Outreach space and programs
- Program/project management to support projects from conception to completion and to support the development of large, project-based proposals
- A diversity of expertise to enable new and unique instrumentation opportunities for Yale students and researchers
- Expanded programming that creates new educational opportunities for researchers and students at all levels

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