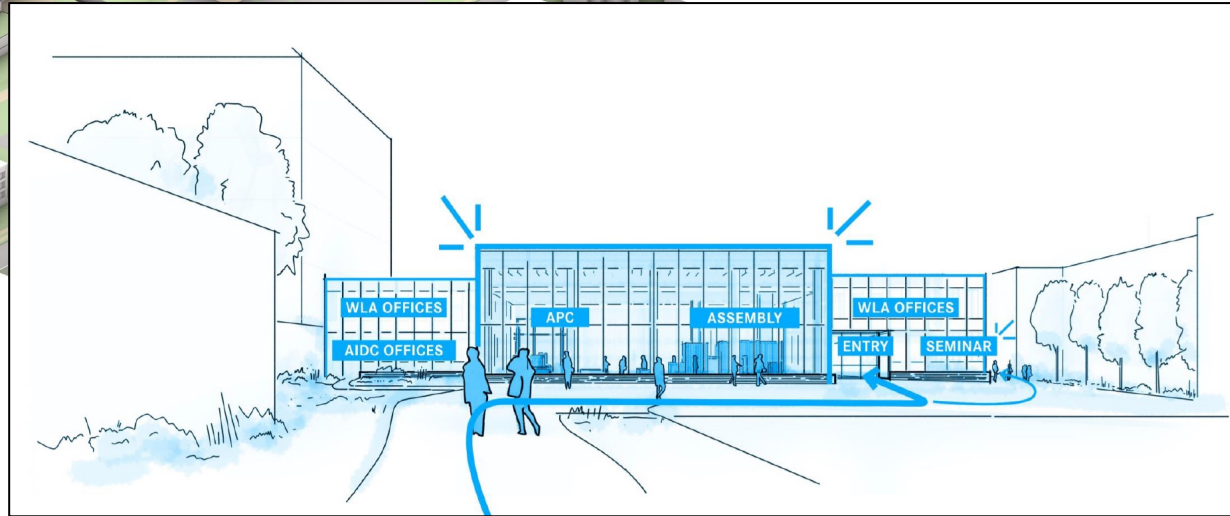
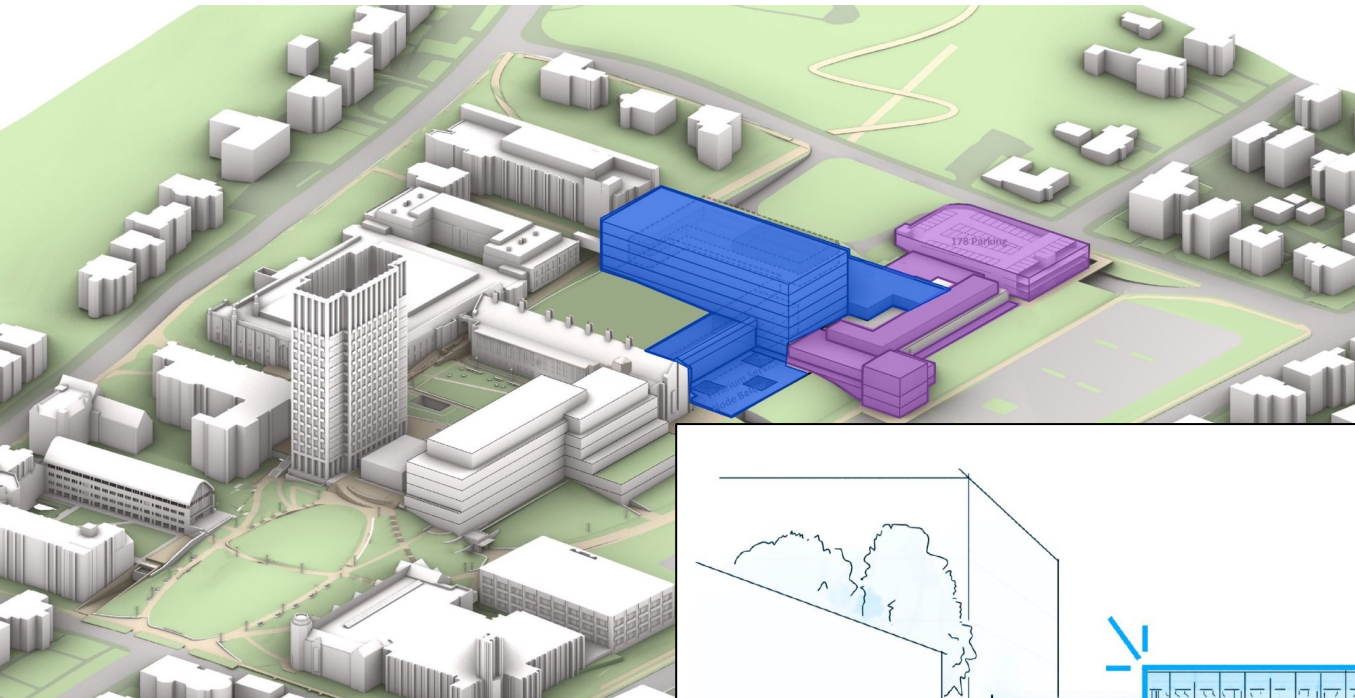


Yale Advanced Instrumentation Development Center (AIDC)



Lisa d'Angelo (co-chair)
Karsten Heeger (co-chair)

Report from the Instrumentation Task Force and AIDC Committee

May 2022

Priority areas

- Quantum science, engineering and materials
- Integrative data science
- Planetary solutions
- Neuroscience, from molecules to mind
- Inflammation science

Cross-cutting initiatives

- Diversity across the STEM pipeline
- **Instrumentation development**
- Core facilities
- Graduate student support

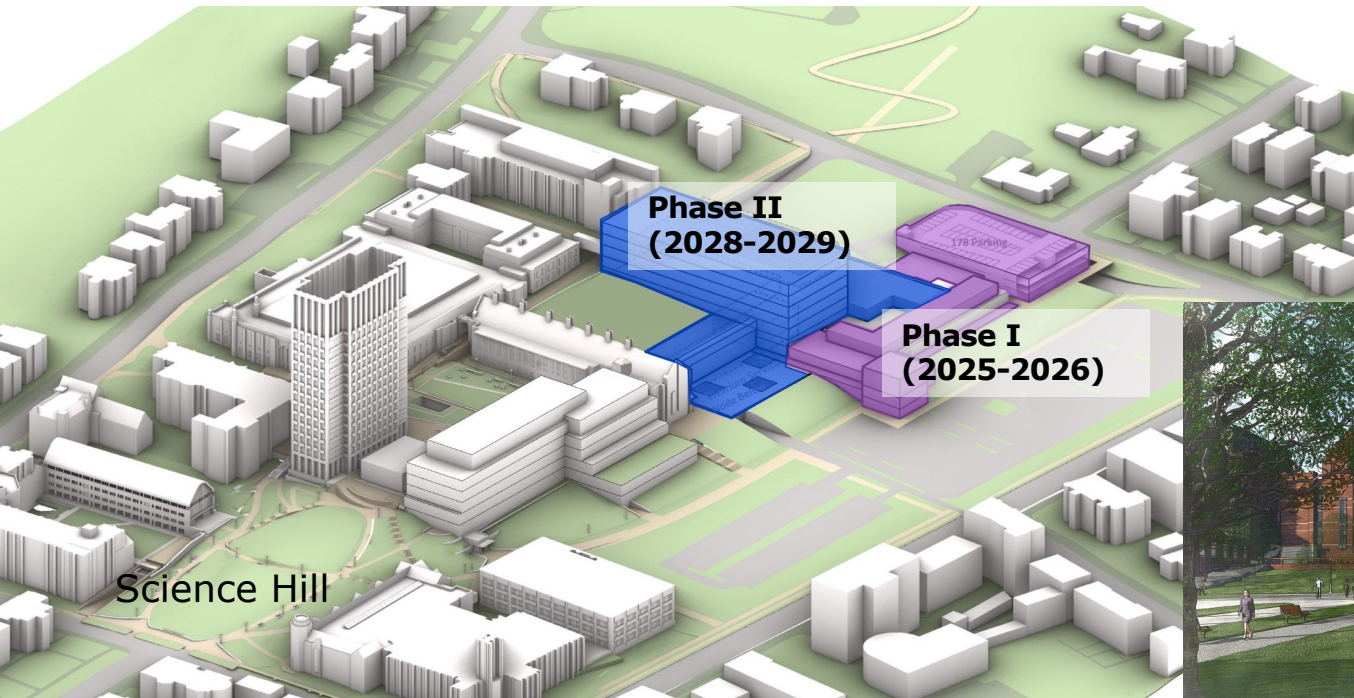
Instrumentation Development: *“The development of new tools and measurement techniques is an essential component of the scientific process, allowing researchers to open entirely new avenues for investigation. We recommend that Yale develop high-capacity centralized instrumentation and engineering facilities to serve as intellectual “hubs” for instrumentation development.”*

USSC report recommends changes to the organizational structures that support science at Yale including

- *Enhance support for professional staff scientists*
- *Increase connections with Brookhaven National Laboratory*

AIDC realizes several recommendations of the 2018 USSC report

Physical Sciences & Engineering Building



Advancing university priorities, building on the success of Wright Lab

Advanced Instrumentation Development Center – Phase 1 (2025-2026)

Discovery science through instrumentation development

Physical Sciences and Engineering Building – Phase 2 (2028-2029)

Harnessing the quantum revolution

AIDC Planning Group

- Karsten Heeger (co-chair) *Chair, Physics; Director, Wright Lab*
- Lisa D'Angelo (co-chair) *Associate Provost for Research*
- Jeffrey Brock (ex officio) *Dean, School of Engineering & Applied Science; Dean of Science, FAS*
- Joerg Bewersdorf, *Professor of Cell Biology and Biomedical Engineering*
- Todd Constable, *Radiology and Biomedical Imaging, Neurosurgery and Biomedical Engineering*
- Mark Johnson, *Chemistry*
- Rajit Manohar, *Electrical Engineering and Computer Science*
- Peter Raymond, *Professor of Ecosystem Ecology*
- Ben Myers, *Director of Research Cores*
- James Nikkel, *WL Associate Director of Instrumentation and Education*
- Steve Brown, *Associate Director Planning Administration*
- Christie Day, *Senior Architect, Planner, Yale Facilities*
- Dev Hawley, *Director University Planning*
- Meg Kirkpatrick, *Associate Provost for Research*
- Sarah Miller, *Assistant Dean for Science & Engineering*
- Julie Paquette, *Director of Energy Management, Yale Facilities*
- Chris Incarvito, *Associate Provost Science Initiatives*

Charged by Provost Strobel in February 2020.

Builds on 3+ years of developing instrumentation initiative on campus
(e.g. 2018 and 2020 Days of Instrumentation, 2020 AIDC workshop, etc.)

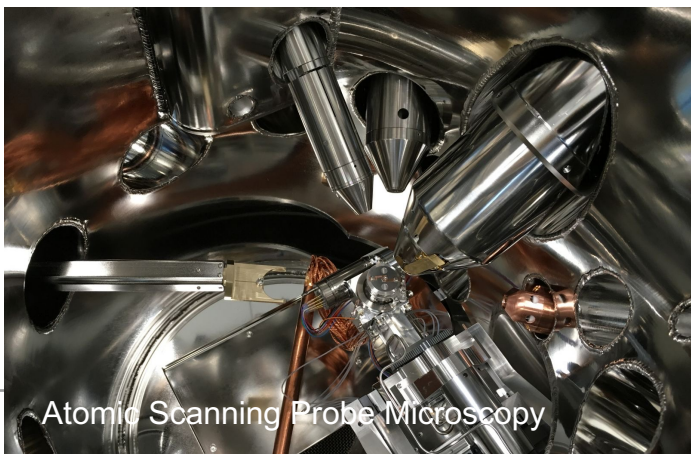
Instrumentation Development @ Yale



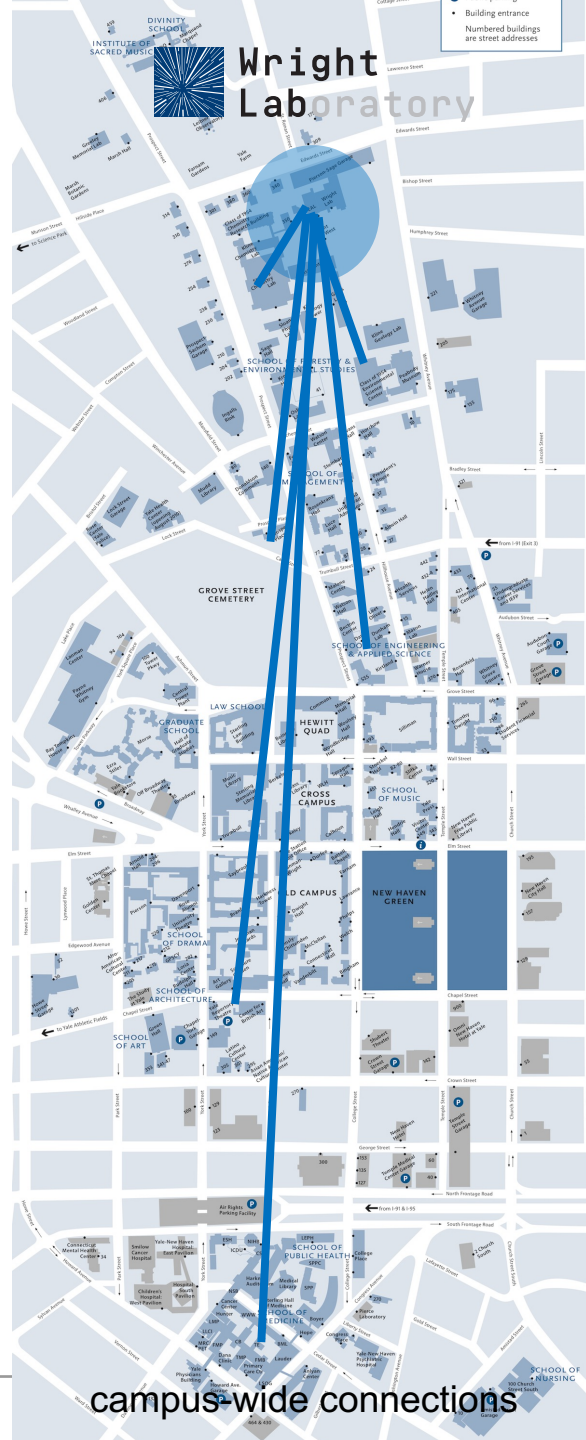
Advanced Prototyping Center @ Wright Lab



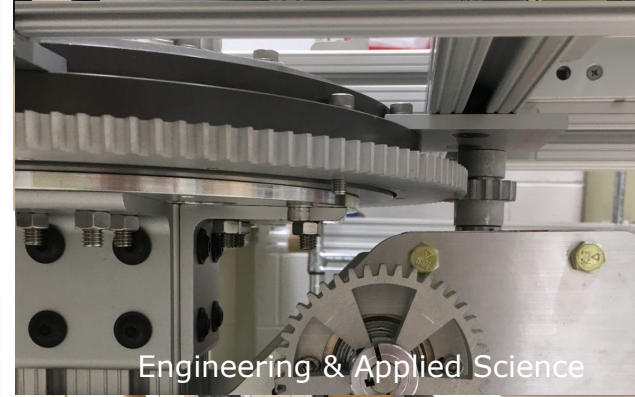
Institute for the Preservation of Cultural Heritage (IPCH)



Atomic Scanning Probe Microscopy



Yale Center for British Arts



Engineering & Applied Science



Yale Peabody Museum

AIDC Vision and Capabilities

Novel Measurements and Discovery Science through Instrumentation Development

Vision

- **A destination and hub for instrumentation development on campus**
- Cross-cutting, serves entire campus
- An entrance to Science Hill and PSEB, visible beacon for world-class physical science at Yale
- Together with WL and PSEB, state-of-the-art complex for physical sciences
- Training and education of students, postdocs, researchers
- Imagining the future: workshops, flexible space

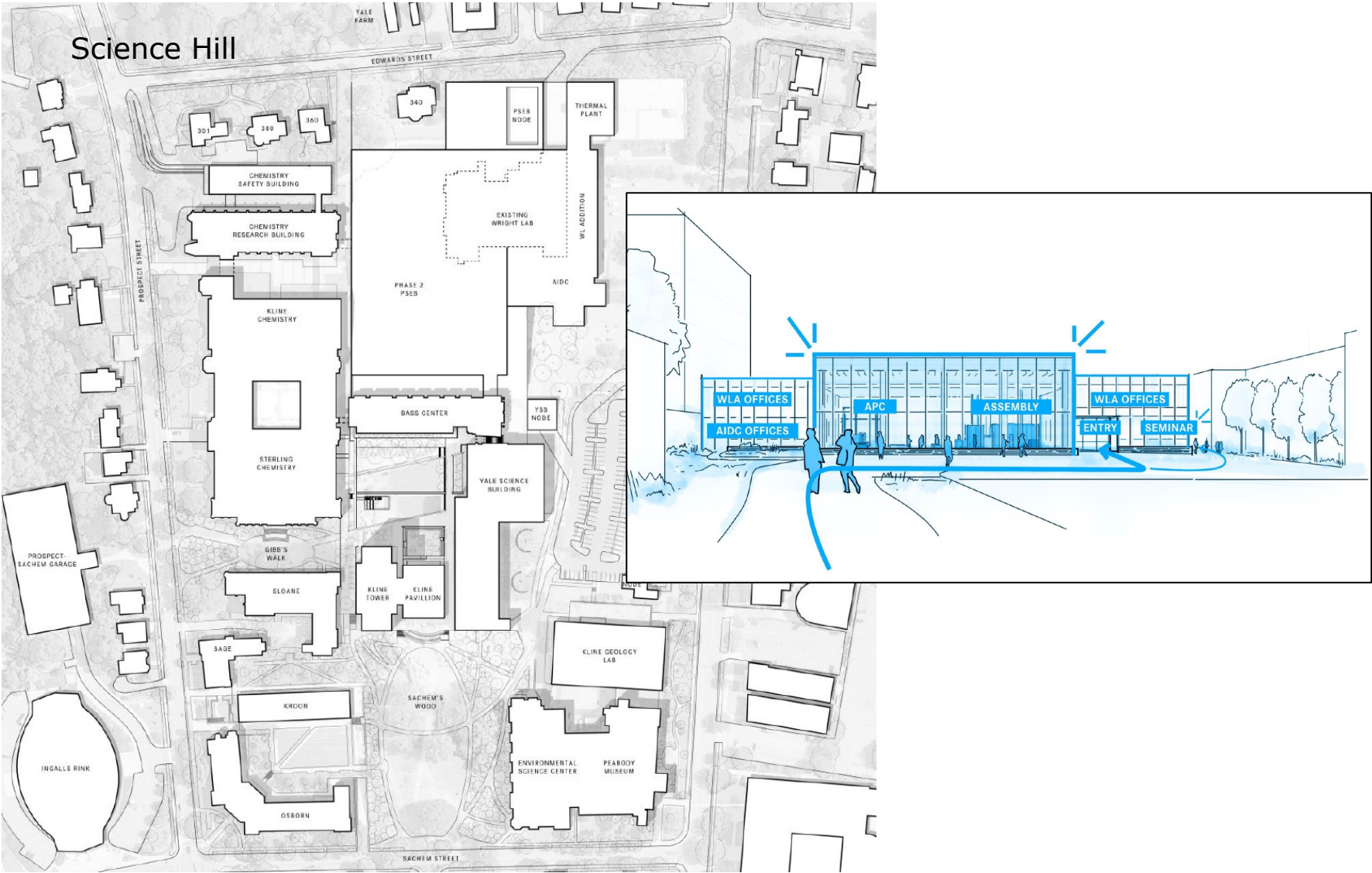
New Capabilities

- **Electronics and data acquisition core**
- **Expanded advanced prototyping center**
- Communal assembly space, R&D labs
- Workshop, training and interaction spaces
- Outreach space and showcase displays

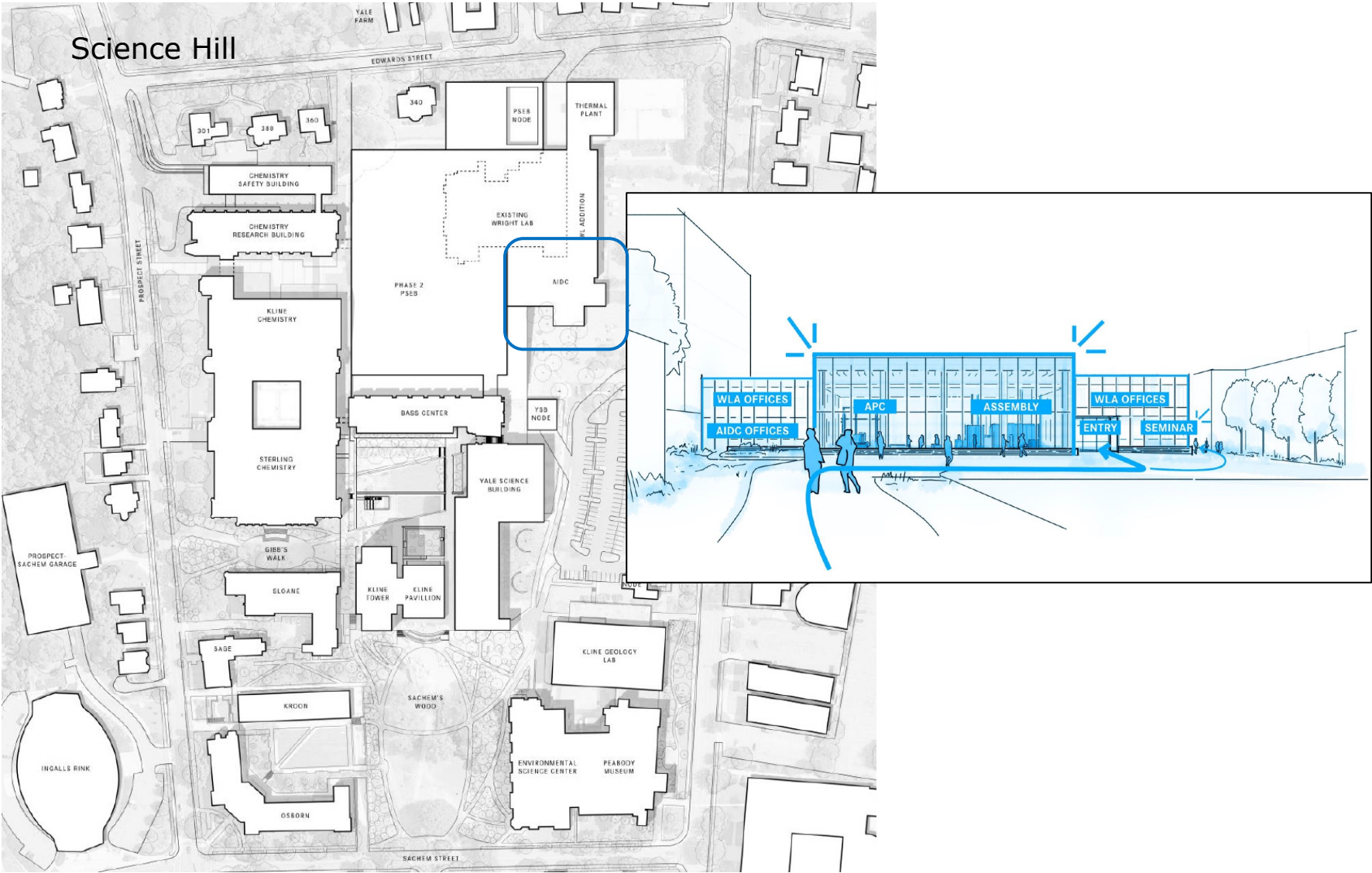
Synergies

- **Truly interdisciplinary**
- Explores connections with data science and planetary solutions
- Synergistic and complementary with CEID and other cores

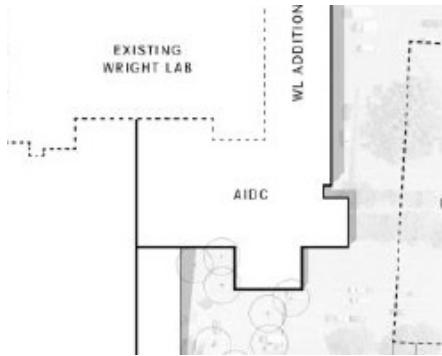
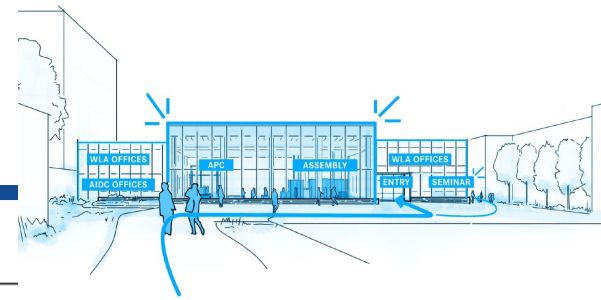
AIDC Planning Update



AIDC Planning Update

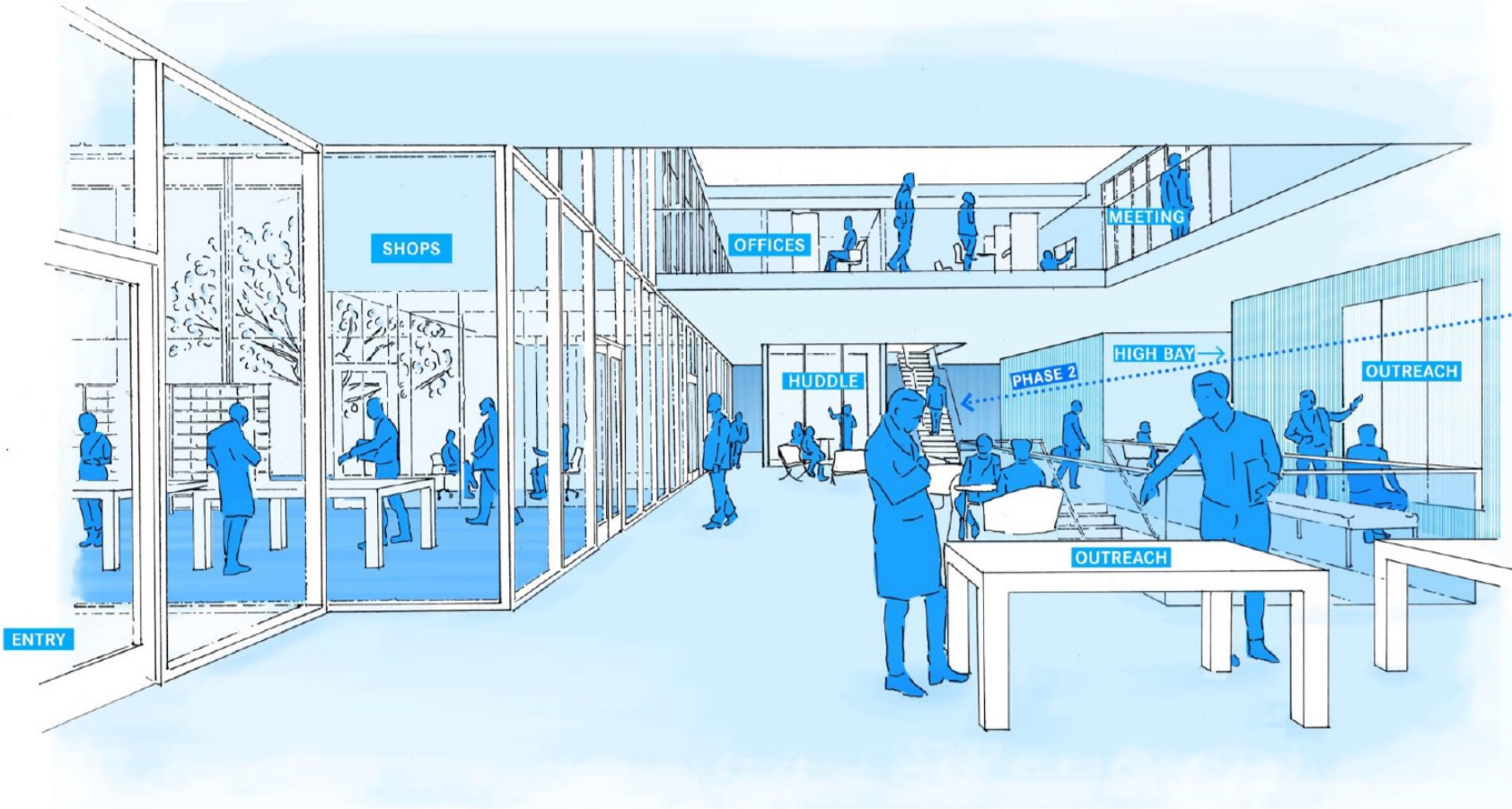


AIDC Planning Update



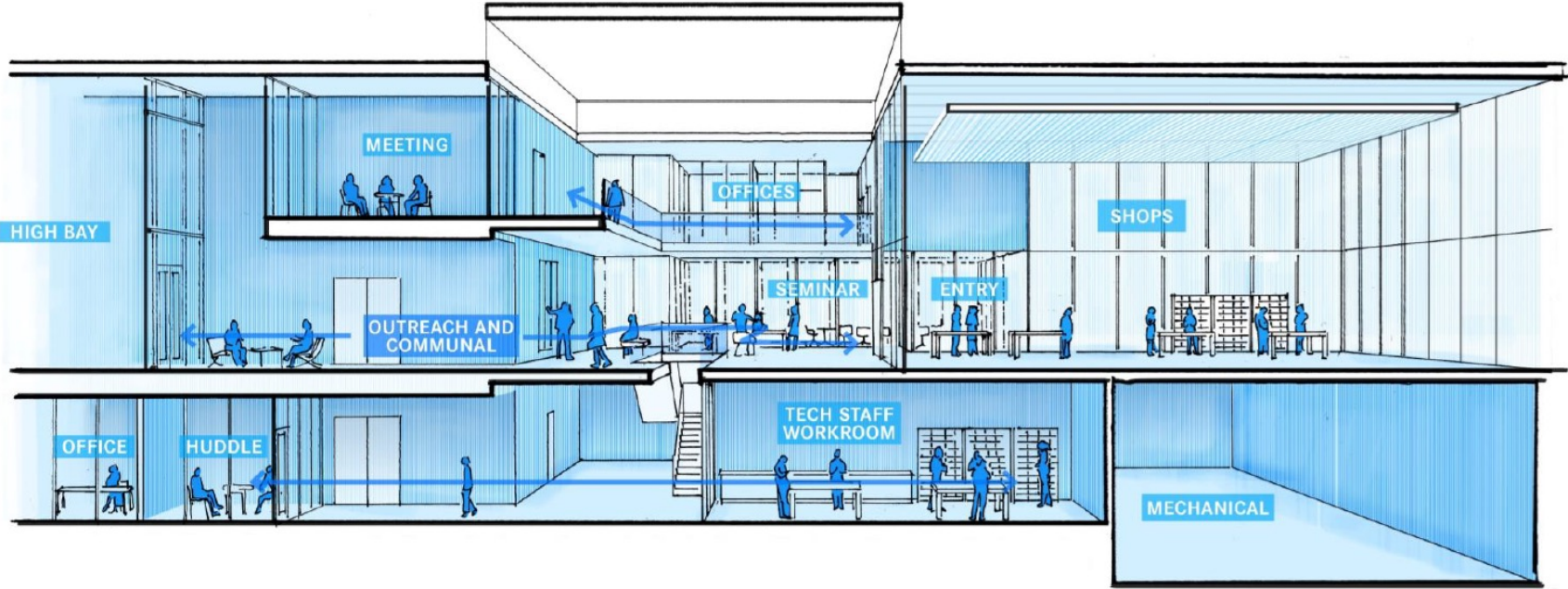
Floor Plan / Level 55'

AIDC Planning Update



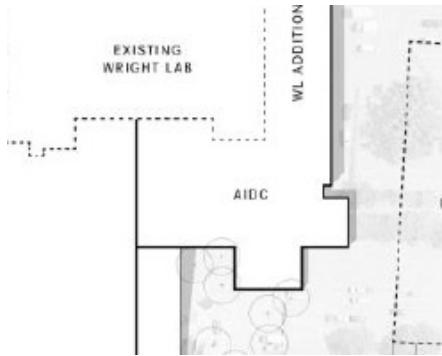
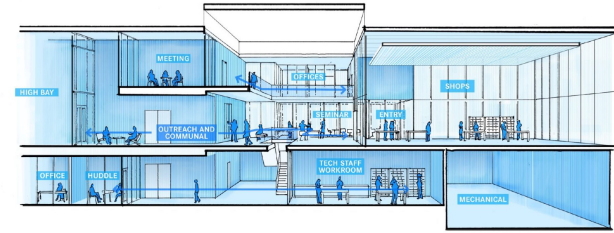
Entry

AIDC Planning Update



Section Perspective

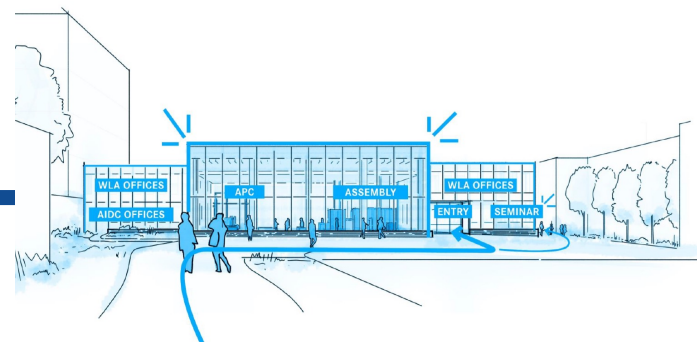
AIDC Planning Update



Section Perspective

Floor Plan / Level 42'

AIDC Summary Paper & Feedback



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

A Whitepaper based on input from the Instrumentation Task Force and AIDC Committees

May 2022

Summary

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

Following the Yale Days of Instrumentation in [2018](#) and [2020](#), Provost Strobel tasked an Instrumentation Task Force to consider how the university might provide new, innovative, physical space and resources to support instrumentation development across disciplines and campus as part of the planning of the Physical Science and Engineering Building (PSEB) complex. This Task Force formulated a vision for what is now named the Advanced Instrumentation Development Center (AIDC) within the PSEB: The mission of the AIDC is to facilitate cross-cutting ideation and innovation as a specialized hub of technical facilities; a resource for engineering expertise; an institute for education and training programs; and a center for community-building efforts, connecting researchers and staff across campus.

As a hub for instrumentation development, the AIDC will be a destination for staff, researchers, and faculty engaged in developing instrumentation and advanced technologies, fostering interdisciplinary initiatives across campus and beyond. With a broad user group, composed of members with extremely diverse interests, the AIDC will support a variety of initiatives, enabling realization of novel and cross-cutting ideation and fabrication activities, including those in quantum science, planetary solutions, and beyond. One example is that the AIDC will 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 will provide the AIDC with a unique role 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 will serve several specific program goals. They include:

- Expand technical support for instrumentation development on campus building on the technical shops and the Advanced Prototyping Center at Wright Lab, and add key

AIDC summary paper:

<https://provost.yale.edu/sites/default/files/files/AIDC%20whitepaper%20Final.pdf>

Welcome feedback and input!

webform

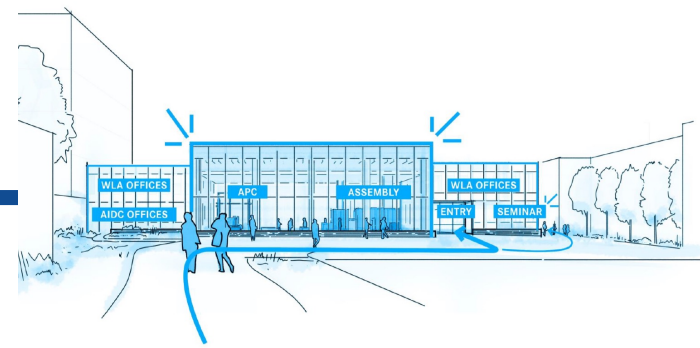


or directly contact

Lisa d'Angelo

Karsten Heeger

AIDC Summary



- **AIDC realizes several recommendations of the 2018 USSC report**
 - Instrumentation development for discovery science
 - Training a diverse science community
- **Opportunity to connect multiple science priorities**
Instrumentation development, data science (“data-enabled smart instrumentation”, creating a data pipeline), supports cores for quantum science
- **Instrumentation task force outlined a vision for AIDC** creating a **unique facility** and making Yale a **destination for physical science**. The concept of the AIDC was presented to, and accepted by, Provost Strobel in 2021.
- An AIDC advisory committee was formed in summer 2021 and has been working with Yale facilities and Ballinger architects to create spaces that will enable the creation of the physical entity. (supports outreach, instrumentation, is a beacon for science, etc.)
- **Welcome feedback and input from the campus community!**