

Department Welcome and Town Hall

Yale *Physics*



*State-of-the-Department:
A Conversation and Listening Session*

Academic Year 2024-2025

Karsten Heeger, Chair

09.18.2024

**PHYSICS
WELCOME
RECEPTION**



PIZZA | MUSIC | GAMES

LEITNER FAMILY

OBSERVATORY LAWN

355 PROSPECT ST., NEW HAVEN, CT 06511

Yale Physics

Yale Physics

Yale Physics Community



Diversity, Equity, and Inclusion

Statement of Principles

Respect

We continually strive to make our department a place that respects people with **diverse** backgrounds and values each others' **creativity**.

Well-being

We commit to actively engage in creating a **supportive** and **safe environment**. Criticism and praise are professional and constructive.

Integrity

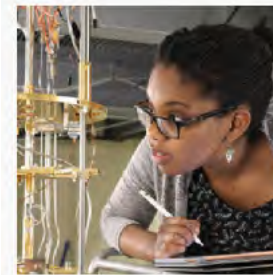
We carry out our work with **honesty** and with the **highest standards**. We shall not commit scientific or academic misconduct, defined as plagiarism, fabrication, or falsification.

Community

Our community actively **includes all**, enhancing **collaboration** and promoting our common mission to advance the frontiers of knowledge.

Developed by Climate and Diversity Committee
and Department

<https://physics.yale.edu/statement-principles>



[Research & Discovery](#)



[Community & Belonging](#)



[News & Honors](#)



[Education](#)



[Outreach](#)



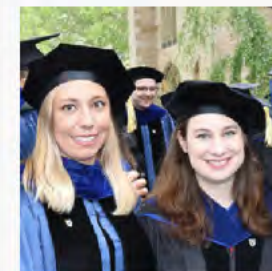
[Get Involved](#)



[Shared Leadership](#)



[Advocacy](#)



[Legacy](#)

<https://physics.yale.edu/diversity-equity-and-inclusion>

Diversity, Equity, and Inclusion

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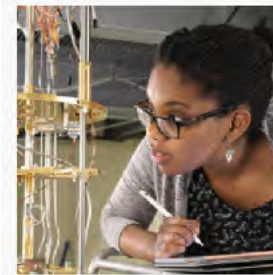
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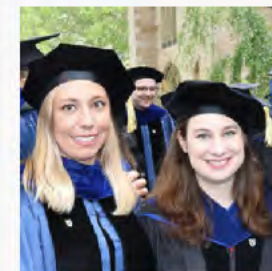
Get Involved



Shared Leadership



Advocacy



Legacy

*How can we foster belonging in
Yale Physics?*

Department Management

Director, Finance and
Administration



Elena Siuzdak

Operations Manager



Maria White

Administrative Services
Supervisor



Layla Nayar

Chair's Office

Chair's Assistant



Jen Ongley

Chair's Office



Kirstin Franzman

Instructional Labs, Demonstrations & Outreach



Stephen Irons

Director of Instructional Labs

Caitlin Hanssen

Lecturer

Paul Noel

Instructional Support Specialist

- New labs
- New apparatus
- New demonstrations
- Material updates
- The return of outreach
- Halloween Show
- Physics Olympics
- Crafts and puzzles

Undergraduate Program



Prof. David Poland
Director of Undergraduate
Studies



Daphne Klemme
Undergraduate Registrar

Undergraduate Student Advisory
Committee (UGSAC)

Undergraduate Program



Prof. David Poland
Director of Undergraduate
Studies



Daphne Klemme
Undergraduate Registrar

Undergraduate Student Advisory
Committee (UGSAC)

What can we do to better

- *recruit our majors?*
- *teach critical skills?*
- *prepare them for graduate school?*
- *prepare them for careers outside academia?*

Graduate Program



Prof. Daisuke Nagai
*Director of Graduate
Studies*



Prof. Helen Caines
Director of Graduate
Admissions



Dr. Rona Ramos
*Graduate Program
Coordinator
Lecturer*



Stacey Watts
*Graduate
Registrar*

Graduate Student Advisory Committee (GSAC)

Graduate Program



Prof. Daisuke Nagai
Director of Graduate Studies



Prof. Helen Caines
Director of Graduate Admissions



Dr. Rona Ramos
*Graduate Program Coordinator
Lecturer*



Stacey Watts
Graduate Registrar

What can we do to better

- *Support our students throughout their dissertation work?*
- *prepare our graduate students for their professional career?*
- *support them during their PhD studies?*

Graduate Student Advisory Committee (GSAC)

Postdoctoral Affairs



Prof. Meg Urry

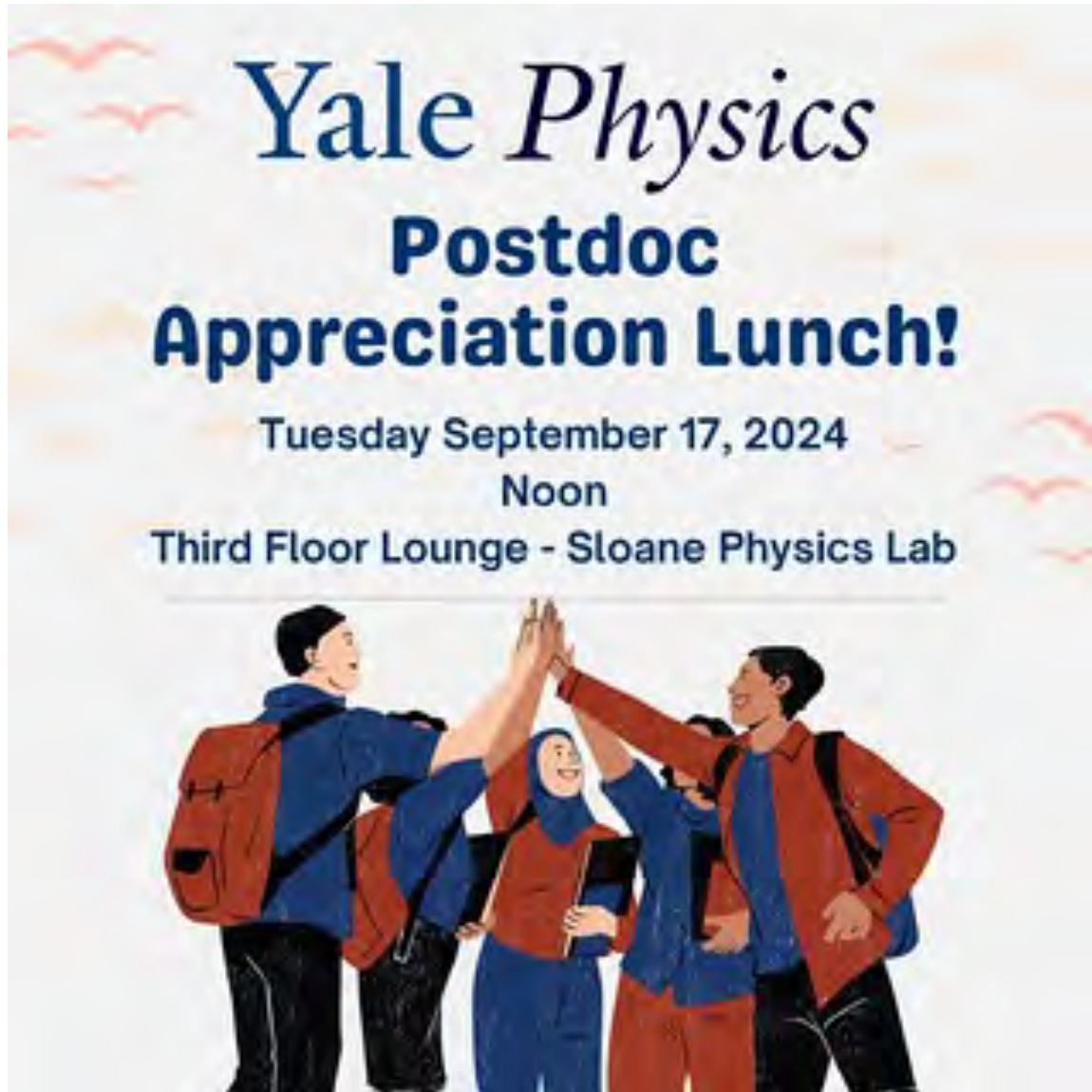
Director of Postdoctoral Affairs

What issues concern our postdocs?

Postdoctoral Advisory
Committee (PDAC)

Let's celebrate
POSTDOCS

Postdoctoral Affairs



Yale Physics
**Postdoc
Appreciation Lunch!**
Tuesday September 17, 2024
Noon
Third Floor Lounge - Sloane Physics Lab

The poster features an illustration of four diverse individuals (two men and two women) wearing blue and red jackets and backpacks, high-fiving each other. The background is light blue with stylized birds flying.

Let's celebrate
POSTDOCS

Yale Physics

Physics Department Self-Study and Review

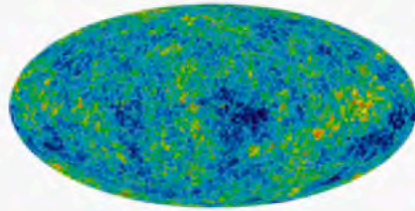
- Every 6-8 years, **scheduled for November 6-8, 2024**
- Prior to review the department writes a self-study report: self-assessment of opportunities and challenges, outlines priorities for the department
- External review committee will evaluate entire department
- **Opportunity for staff, scientists, postdocs and students to meet review committee**, share your experiences.
 - If you have good things to say about Physics *tell them why*. The university will carefully read the report from the review committee.
 - If something needs to be fixed, *please let us know. We want to identify challenges and propose a plan of what to do about it.*
- We may send you a Google questionnaire, please respond

Research Areas

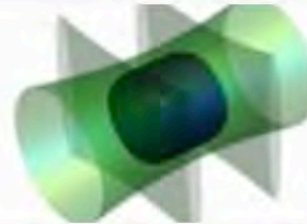
broad research portfolio in experiment and theory

new science initiatives on campus

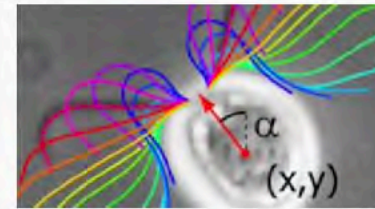
- quantum science
- data science
- instrumentation



[Astrophysics and Cosmology](#)



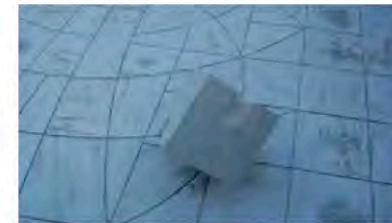
[Atomic, Molecular, and Optical Physics](#)



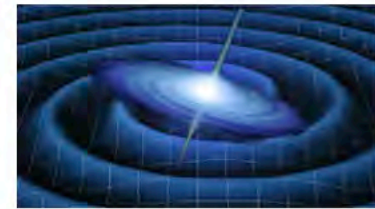
[Biophysics](#)



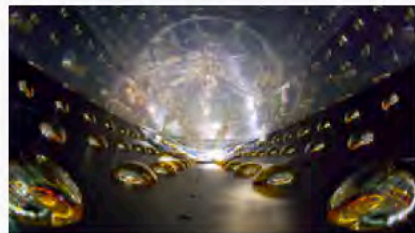
[Condensed Matter Physics Experimental](#)



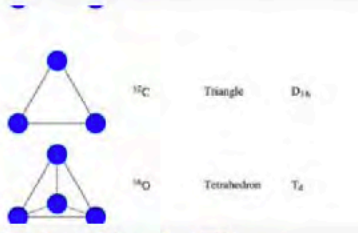
[Condensed Matter Physics Theory](#)



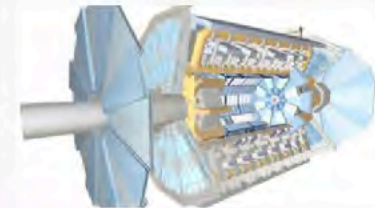
[Gravitational Physics](#)



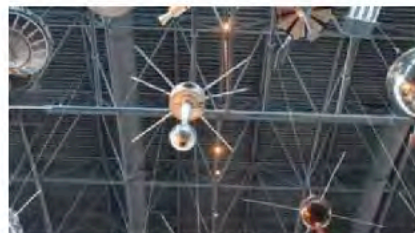
[Nuclear Physics Experimental](#)



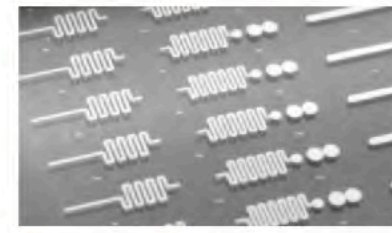
[Nuclear Physics Theory](#)



[Particle Physics Experimental](#)



[Particle Physics Theory](#)



[Quantum Physics](#)

<https://physics.yale.edu/research>

Research Areas in the Physics Department

- AMO
- Astrophysics & Cosmology
- Biophysics
- Condensed Matter
- Gravitational Physics
- Nuclear/Particle
- Quantum

Experiment

Theory

Theory & Experiment

Observation

Potential Future Opportunities

- Astrophysics/cosmology
- Biophysics
- Condensed matter experiments
- Theory, broadly defined
- Quantum/AMO
-

*(in alphabetical order,
no prioritization yet)*

Are we missing any exciting opportunities?

How can we best connect to the AI/ML initiative on campus?

Yale Physics in Research Centers & Institutes



YCAA Yale Center for Astronomy and Astrophysics



Quantitative Biology Institute [QBio]



Yale's Integrated Graduate Program In **PHYSICAL** and **ENGINEERING BIOLOGY**



ESI Energy Science Institute

WU TSAI INSTITUTE
YALE UNIVERSITY

Systems Biology Institute



Yale *Physics*

Yale Physics in Research Centers & Institutes

Leadership



YCAA Yale Center for Astronomy and Astrophysics



Involvement

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How do we best collaborate with institutes on campus?

Partnerships with other departments

- Astronomy
- Applied Physics
- Earth and Planetary Science
- Mathematics

New SEAS department

- Materials Science?

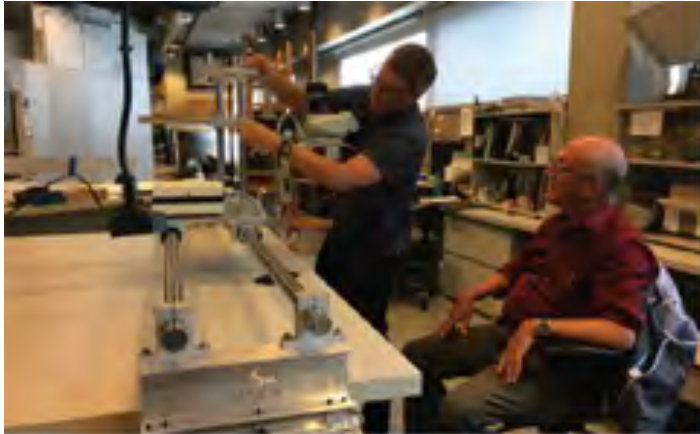
How do we best collaborate with other departments?

Joint activities

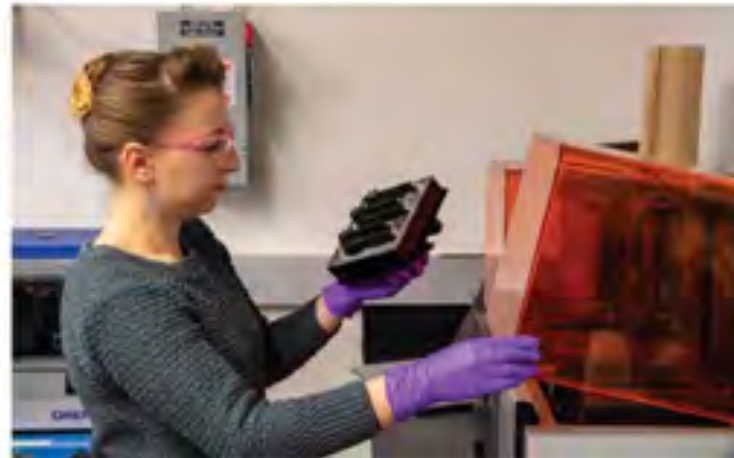
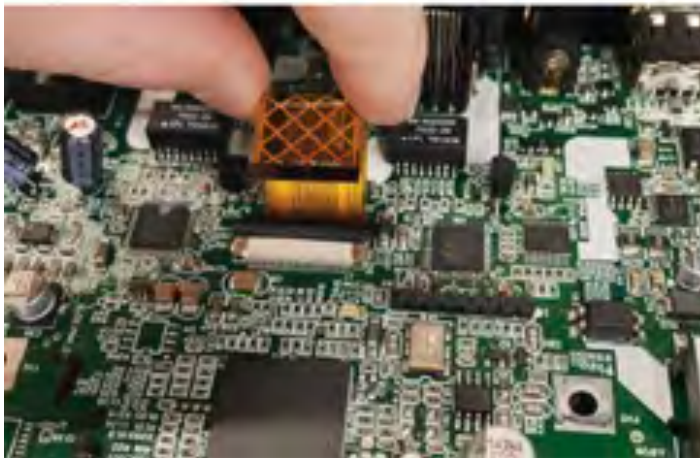
- *Joint faculty appointments*
- *graduate students*
- *Cross-listed courses*
- *Research collaborations*

Teaching: A New Course in the APC

Phys 765: Advanced Scientific Instrumentation Development, Prototyping and Fabrication



Instructor: James Nikkel
TF: Arina Telles



<https://wlab.yale.edu/news/yale-physics-offers-new-course-research-instrumentation-design-and-development>

Outreach: Summer Explorations in Science, Technology and the Natural World

A science and robotics camp for middle school girls



<https://wlab.yale.edu/news/local-students-explore-science-technology-and-natural-world-wright-lab>

SPL Construction in 2020-2023

....and it continues



May 2021

2023-2024 KT Opening

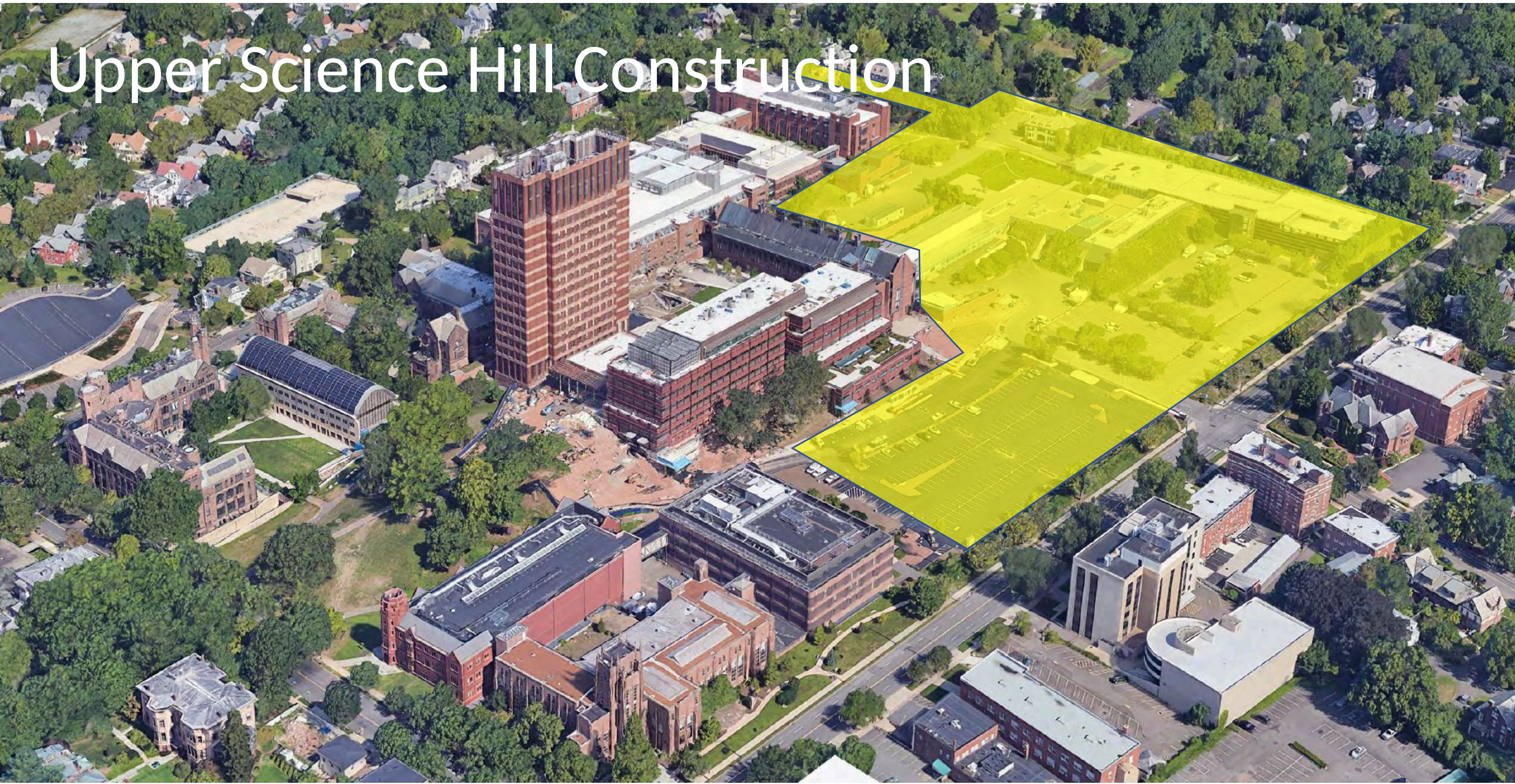
With astrophysics and some
particle physics



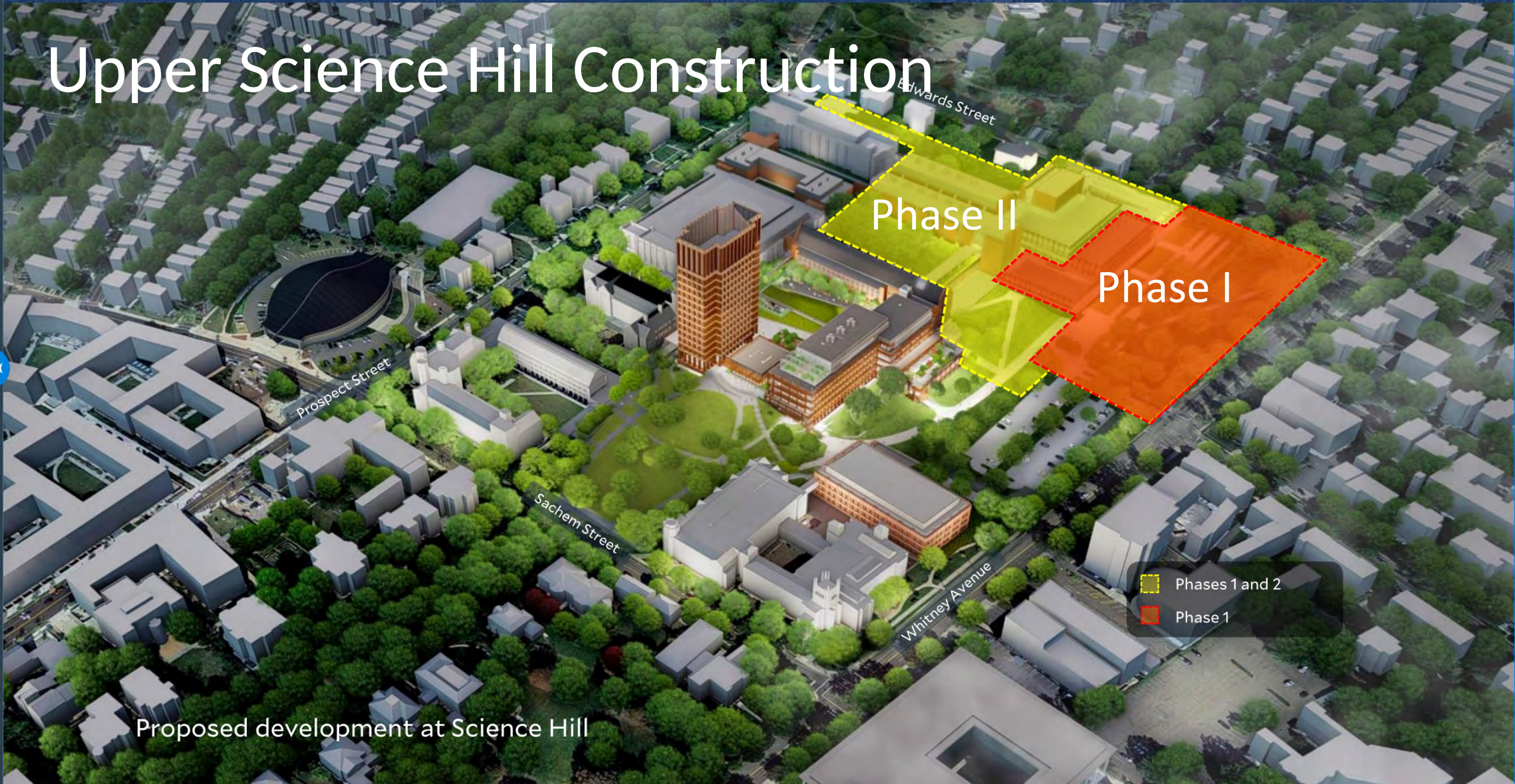
Wright Lab Construction 2024-2029



Upper Science Hill Construction



Upper Science Hill Construction



Prospect Street

Edwards Street

Sachem Street

Whitney Avenue

Phase II

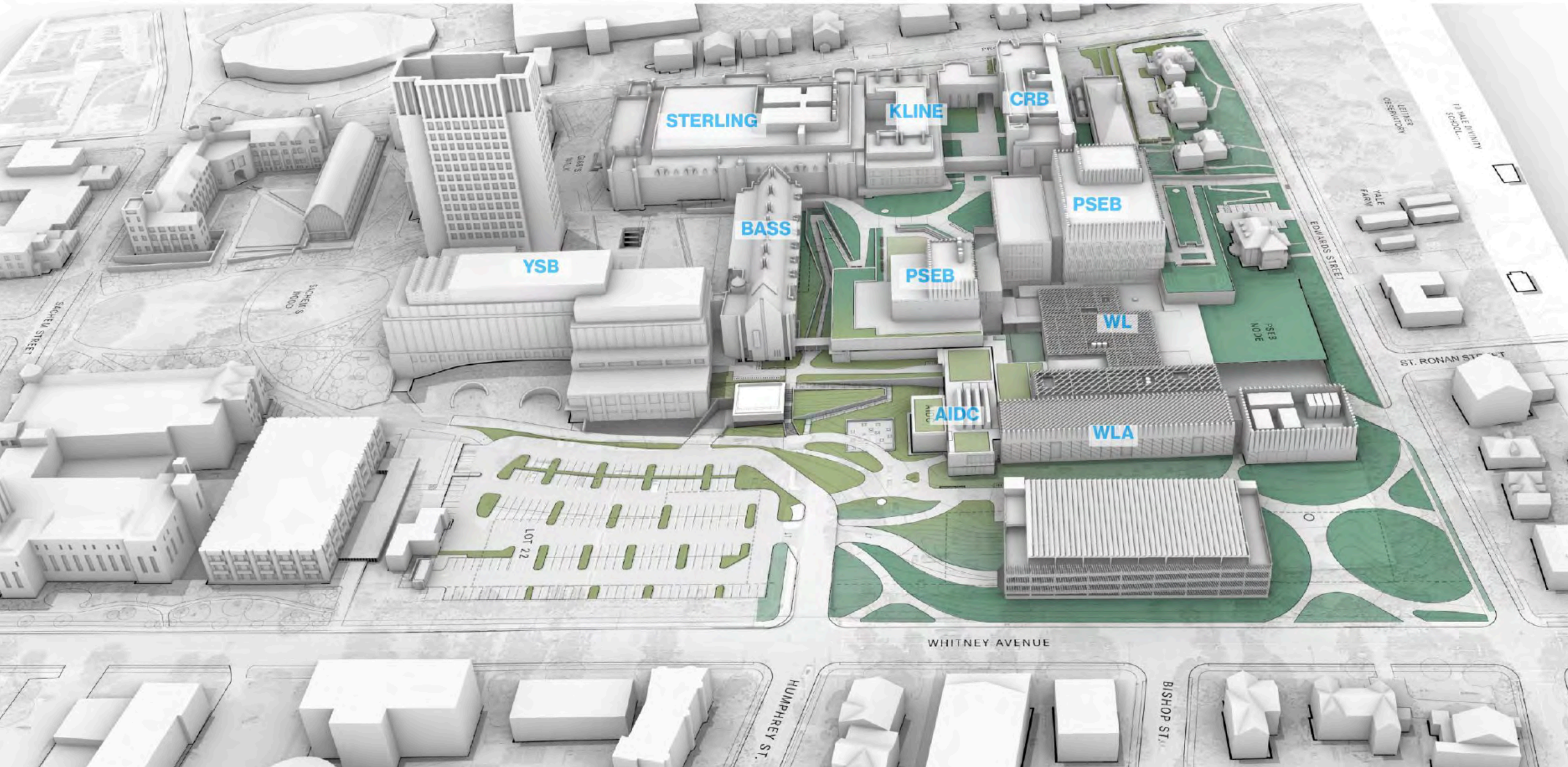
Phase I

■ Phases 1 and 2
■ Phase 1

Proposed development at Science Hill

Upper Science Hill Construction

View from East



Physical Science and Engineering Building (PSEB)



The Yale Quantum Initiative

Physical Science and Engineering Building

Program growth

Yale plans growth of ~ 20 new faculty hires in quantum science, engineering, and materials over the next decade.

New core facilities to enable cutting-edge research

10,000 sq ft cleanroom and nanofabrication

5,000 sq ft imaging center

5,000 sq ft materials characterization facility



Physical Science and Engineering Building (PSEB)- opening 2029

- > 175,000 sq ft of state-of-the-art laboratory space
- Integrated into upper Science Hill community
- Colocating science and engineering as never before
- Space for ~ 50 research groups, plus institute and common spaces

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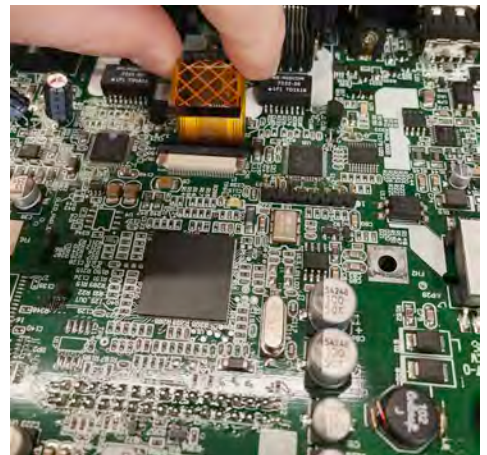
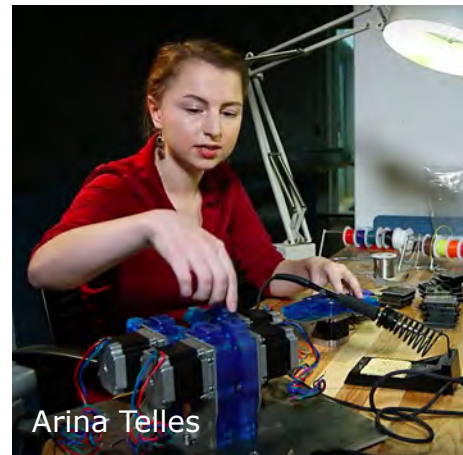
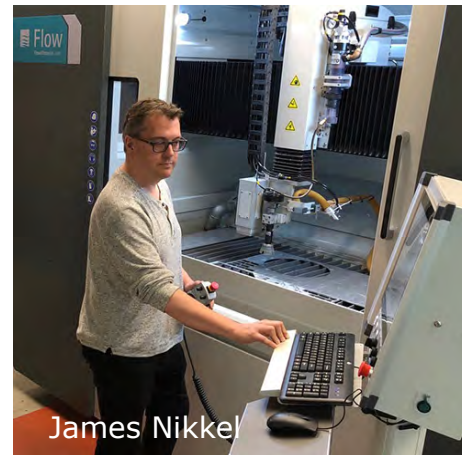
How do we take advantage of PSEB?



USSC Report

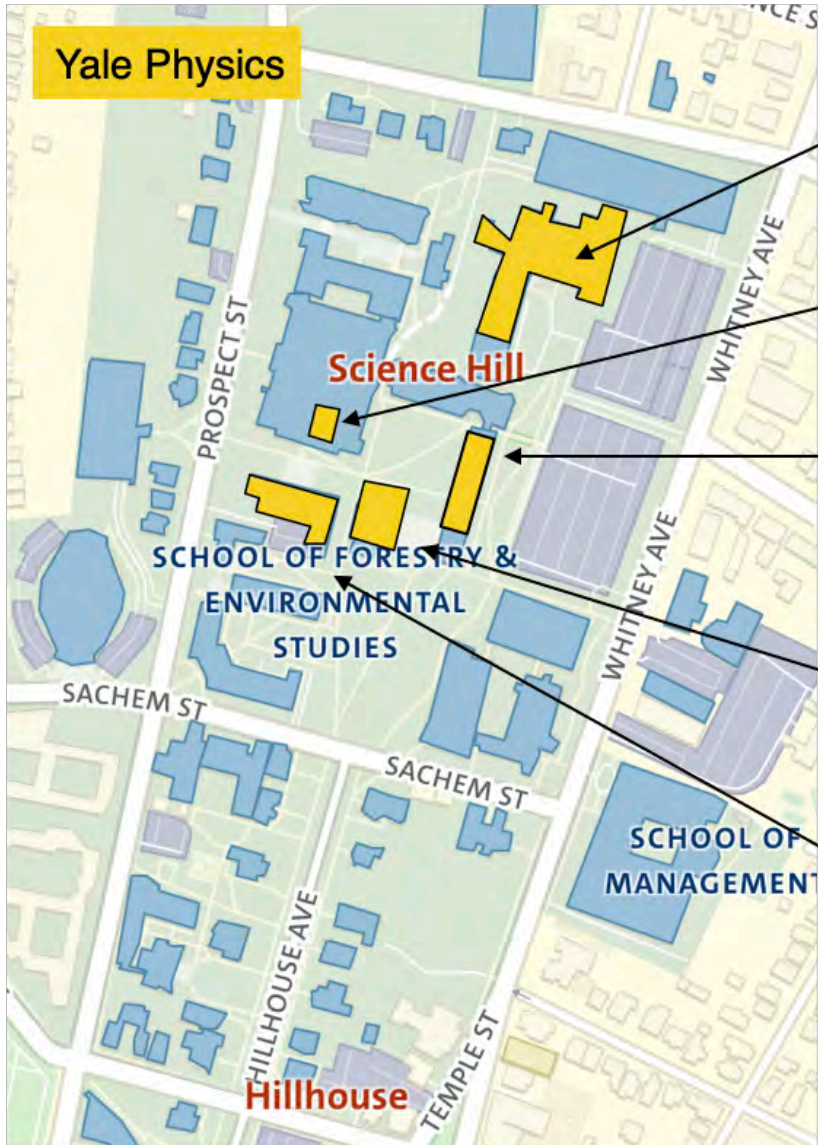
"We recommend that Yale develop high-capacity centralized instrumentation and engineering facilities to serve as intellectual 'hub' for instrumentation development."

AIDC is one of the cross-cutting USSC priorities and an evolution of the existing **Advanced Prototyping Center (APC)** at WL.



APC is a single room in Wright Lab with 2 part-time staff.
AIDC will have dedicated staff, machine space, assembly area, electronics core, and short-term R&D labs **servicing users across campus.**

Yale Physics Department (on central campus)



Wright Laboratory (WL)

- experimental laboratories and technical facilities
- nuclear, particle, astrophysics

Teaching Laboratories (SCL)

Yale Science Building (YSB)

- biological physics and QBio
- AMO, quantum science

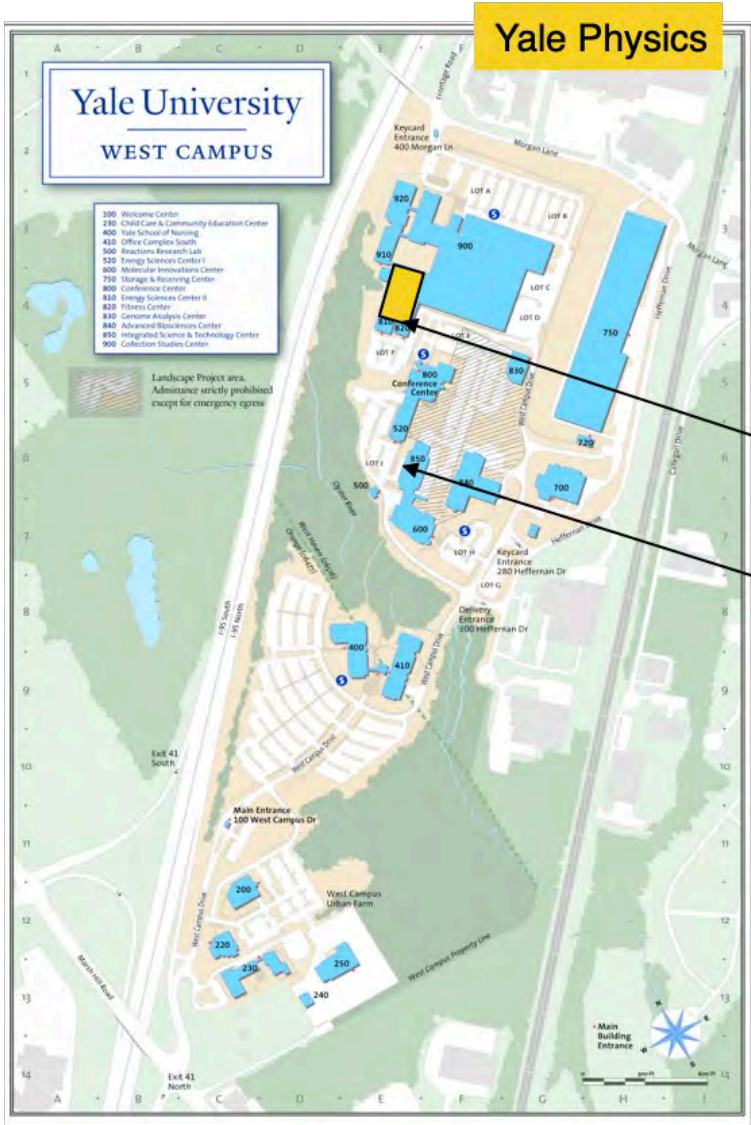
Kline Tower (KT)

- astrophysics (and astronomy)
- particle physics, data intensive science

Sloane Physics Building (SPL)

- lecture halls, teaching
- central business office
- AMO, bio, condensed matter
- theory

Yale Physics Department (on west campus)

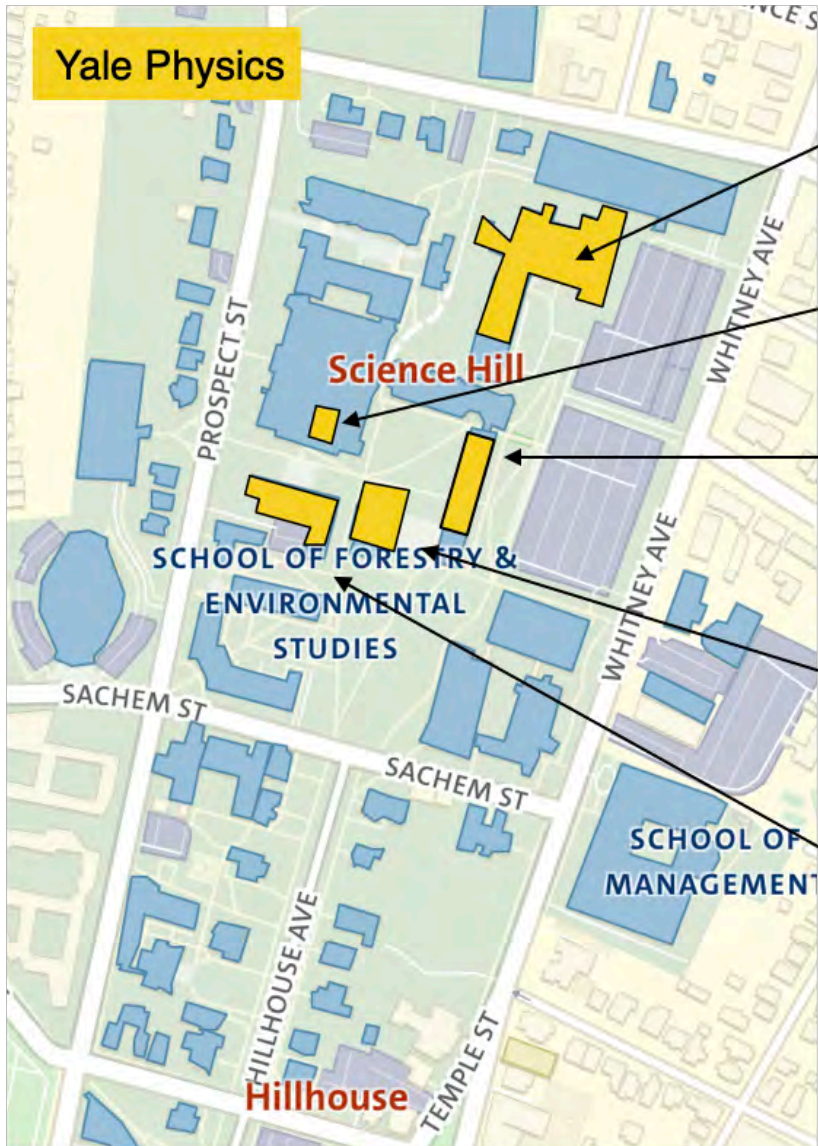


Energy Sciences Institute (ESI)
 - Condensed matter physics, materials science

Systems Biology Institute

©2018. For use while the West Campus landscape improvement project is under way.
 Note parking lot identifiers A-H and J and shuttle stops ⑤.

Yale Physics Department (on central campus)



Wright Laboratory (WL)

- experimental laboratories and technical facilities
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Kline Tower (KT)

- astrophysics (and astronomy)
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How do we maintain the cohesion and community of Yale Physics across 6 locations?

Some Opportunities and Challenges

Opportunities

- Excellent people (faculty, staff, students, postdocs scientists)
- New spaces and lab spaces
- Exciting campus-wide initiatives
- Growth in some subfields

Challenges

- Continuous renovations and construction impact
- Funding and student remains a challenge in some subfields
- Distribution of department across several locations

Physics Department Self-Study and Review

- What are the most pressing issues facing the Physics Department?
- What can we do to better support you and the physics community at Yale?
- How do we best position ourselves for the future?

Your comments and input are welcome!

