Yale Graduate Programs: Physics and Applied Physics

physics.yale.edu
Yale Graduate Programs: Physics and Applied Physics

represented here by -

Prof. Bonnie Fleming
Director of Graduate Studies, Physics

Dr. Rona Ramos
Graduate Program Coordinator, Lecturer, Physics

Stacey Watts
Graduate Program Registrar, Physics

Prof. Helen Caines
Director of Graduate Admissions, Physics

Prof. Karsten Heeger
Chair, Physics

Prof. Shruti Puri
Applied Physics

Prof. Yu He
Applied Physics
Yale Graduate Programs: Physics and Applied Physics

represented here by -

Sumita Ghosh
Applied Physics (Year 6)

Shivnag Sista
Physics (Year 2)

Sohan Vartak
Physics (Year 5)

Andy Ding
Physics (Year 3)

Kimmy Cushman
Physics (Year 5)

Rajeev Erramilli
Physics (Year 4)

Iris Ponce
Physics (Year 2)

Yizhi (Royce) Luo
Applied Physics (Year 5)

Kaavya Sahay
Applied Physics (Year 1)

Alec Eickbusch
Applied Physics (Year 5)
Yale Physics by the Numbers 2021

People

- faculty (primary) 35
- faculty (secondary) 16
- research scientists 25
- postdocs 31
- grad students (physics) 133

- median time to graduation 6.2 years
- many opportunities to seek Interdisciplinary research

Physics students have diverse interests working with advisors in Physics and related disciplines

- 62% Physics
- 21% Applied Physics
- 14% bio/medical
- 2% astronomy
- 1% geo
Research Areas

traditional and emerging research areas

research portfolio of department is evolving

new science initiatives on campus

- data science
- quantum science
- instrumentation

https://physics.yale.edu/research
Wright Lab supports a diverse community of scientists, staff, and students who advance our mission and fosters cross-disciplinary collaborations across Yale University and worldwide.

State-of-the Art Facilities

wlab.yale.edu
Academic Life and Campus Resources

Physics Colloquia and Seminars

Department of Physics

Upcoming Events

- **November 21, 2019**
  - 3:00pm: Mossman Seminar: Andreas Helset, NBI [via Skype]. "Heavy Particle Effective Theories"
  - 6:00pm: NPA Seminar: Brian Beckford, University of Michigan. "Progress on the search for the elusive K_{L0} mu mu with the KOTO Detector"
  - 6:00pm: Condensed Matter Seminar: Chaitanya Murphy

Graduate Student Town Halls

Regular meetings with department leadership

Graduate Student Advisory Committee

Yale Scientific Teaching Course

teaching fellows

Yale Science Diplomats

outreach

advocacy
Student Groups

Climate and Diversity Committee

Women in Physics (+Allies)

Yale Physics Professional Development Organization

Graduate Student Assembly

QuARK (Queer Affiliated fRiends of physiKs)

Department Happy Hour
Diversity, Equity, and Inclusion

Yale Physics is committed to fostering an environment of diversity, equity, and inclusion for every member of our department community as we strive for excellence in research, teaching, and mentoring.

Yale Physics is leading a variety of efforts to create a more inclusive, equitable, and welcoming department community, including the undergraduate Women in Physics (WiP) and graduate Women in Physics (WiP); QuARK (Queer Affiliated friends of physicists); and outreach with Girls Science Investigations. Yale Physics is now also an active member in the APS-IDEA network. Some of our initiatives are highlighted below; please explore the links for more information. There are many ways to get involved.

Last year our most diverse class to date → notably majority female class!

https://physics.yale.edu/diversity-equity-and-inclusion
Outreach Opportunities

https://physics.yale.edu/outreach-events
Impact Beyond the Discipline

Wright Laboratory Artist-in-Residence

Emily Coates

Agnes Mocsy
2018-2019 Presidential Visiting Fellow

Physics Meets the Arts
Phys 045 Spring 2019

Professor Ágnes Mócsy

Yale Physics
Physics Ph.D students’ learning objectives
guide to the graduate program

1. Students will acquire a general foundational knowledge of physics at the graduate level and the necessary accompanying methodological aspects of mathematics, computing, and instrumentation.

2. Students will learn to identify and solve problems at the frontier of physics knowledge, uphold standards of scientific integrity, and disseminate their research.

3. Students will become educators and communicators with the ability to promote an understanding and appreciation of physics across the university and in society.

4. Department members and students will work together to develop and realize, in the department and in the community, progress and success in diversity, equity, and inclusion in all aspects of the scientific enterprise.
Graduate Program

- **Coursework**
  - Must take or pass-out of 6 core courses, take at least one advanced elective and a Special Investigation (research) course

- **Teaching**
  - 10hrs/week of teaching for first 2 years
  - Learn to teach, deepen your knowledge of Physics

- **Qualifying Event**
  - Four 4-question “Event” → Not an exam! Taken at the beginning of the 2nd year. Part of the learning milestone’s of the department. All students pass by participation!

- **Research**
  - typically, start in first year, full-time in summer after year 1
  - by mutual arrangement, you can start summer before you start graduate school (early start)

- **Flexibility in program**
  - many ways to personalize your course of study and research
  - admission to Yale does not bind you to a specific program

https://physics.yale.edu/academics/graduate-studies
Career Mentoring

- Career development workshops through YPPDO (Yale Physics Professional Development Organization)
  - [https://yppdo.yale.edu/](https://yppdo.yale.edu/) and [https://wlab.yale.edu/calendar/year](https://wlab.yale.edu/calendar/year)

- Majority of our students go on to University/Lab Post-doctoral positions. Second largest group goes to Data Science/Engineering in Industry

- Support Career Mentoring towards academia, government, industry, and beyond

[https://physics.yale.edu/people/alumni](https://physics.yale.edu/people/alumni)
Come and meet us!

Physics and Applied Physics Open House
Tentatively…. March 10-11, 2022
Contact and Information for Physics

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Graduate Program Coordinator  
Lecturer

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Chair

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Director of Graduate Studies

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Research

Materials

Optics

Quantum information

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<td>Michel Devoret</td>
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<td>Sohrab Ismail-Beigi</td>
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<td>Peter Schiffer</td>
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<td>Nick Read (joint)</td>
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+ Tight collaborations with Physics, ESI, MEMS, ChemE, CS (Jack Harris, Diana Qiu, Eduardo da Silva Neto, Peijun Guo, Hongxing Tang, …)

Yale University
Topical Interests

Why is Tc so high?

Can $F = e^2 / r^2$ be manipulated?

Make wafer-scale 2D quantum materials

Robust quantum error correction

Make random medium lase!

Entangle qubits “on-demand”!

Opto-mechanical tuning and application in Quantum Info

Are there bounds to light-matter interactions?

Continuous monitoring of superconducting spin qubit

Yale University
Ph. D. Requirements and Highlights

First year fellowships: all first-year Ph.D. students are financially supported by the department. During the first year, a student typically will take “Special Investigation” (aka research rotation!)

Teaching experience is an integral part of graduate training; all students serve as Teaching Fellows for one year

Area examination in year 3: students showcase breadth and depth of knowledge, chaired by advisor

Course requirements: At least 9 course units (including SI), with strong encouragement of core courses in Quantum Mechanics, Electrodynamics, and Condensed Matter Physics
The Future at Yale University

President Peter Salovey: We are going to spend disproportionately on science and engineering (~$2B).

University Science Strategy Committee chaired by Vice President Scott Strobel

Top priority: Quantum Science, Engineering, and Materials

School of Engineering and Applied Science (SEAS) strategic planning

Close tie to US DOE facilities: Brookhaven National Lab
Distinguished research and leadership activity

Awards: 5 Packard fellows, NAS, AAAS, FRS

1 Sterling professorship, 7 endowed professorships

Leadership: Vice Provost for Research

Directors of CRISP, YQI, YINQE, Yale Cleanroom

2/5 national Quantum Information Science centers (>$100M):

- C²QA · Co-design Center for Quantum Advantage
  Director: Steve Girvin

- QSA · Quantum Systems Accelerator
  Director: Irfan Siddiqi

NSF QLCI center for Robust Quantum Simulation ($25M)

Yale lead: Shruti Puri
Yale University

Applied Physics Recent Alumni

Princeton
- Houck
- Delft

Berkeley
- Siddiqi
- Vienna

Wisconsin
- Vavilov
- Tsinghua

Chicago
- Schuster
- ETH Zurich

NIST/CU
- Teufel
- McGill

MIT
- Kolpak
- Northwestern

Princeton
- Tureci
- Northwestern

Colgate
- DiCarlo

Innsbruck
- Majer

Chalmers
- Sun

Surrey
- Walraff

Maryland
- Clerk

Jülich
- Koch

JILA
- Marquardt

Segall
- Kirchmair

Isacsson
- Ginossar

Manucharyan
- Catelani

Lehnert
Startups from Applied Physics

Quantum Science Pioneer Michel Devoret Joins Alice and Bob as Scientific Advisor

By Matt Swayne  October 12, 2021

Alice and Bob, a quantum computer startup based in France, announced that Michel Devoret will be joining their team as a scientific advisor.
Contact Info

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