Yale Graduate Programs: Physics and Astronomy

physics.yale.edu

Yale Physics
Yale Graduate Programs: Physics and Astronomy

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
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Prof. Karsten Heeger
Chair, Physics

Prof. Jeffrey Kenny
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Prof. Marla Geha
Professor of Astronomy and Physics

Prof. Héctor Arce
Director of Graduate Studies, Astronomy
represented here by

Sanah Bhimani (Year 3)
Physics

Caitlin Gish (Year 2)
Physics

Joseph Shomar (Year 3)
Physics

Yasmeen Asali
Astronomy

Imad Pasha (Year 3)
Astronomy

Malena Rice (Year 5)
Astronomy
# Yale Physics by the Numbers 2021

## People

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>faculty (primary)</td>
<td>35</td>
</tr>
<tr>
<td>faculty (secondary)</td>
<td>16</td>
</tr>
<tr>
<td>research scientists</td>
<td>25</td>
</tr>
<tr>
<td>postdocs</td>
<td>31</td>
</tr>
<tr>
<td>grad students (physics)</td>
<td>133</td>
</tr>
</tbody>
</table>

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

- median time to graduation 6.2 years
- many opportunities to seek Interdisciplinary research
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
Yale Physics Research in Campus Centers

Wright Laboratory

YCAA (Yale Center for Astronomy & Astrophysics)

Quantitative Biology Institute [QBio]

PEB

Yale’s Integrated Graduate Program In Physical and Engineering Biology

Energy Science Institute

Systems Biology Institute

Yale Physics
State-of-the Art Facilities
Academic Life and Campus Resources

Physics Colloquia and Seminars

Department of Physics

Graduate Student Town Halls

Regular meetings with department leadership

Graduate Student Advisory Committee

Yale Scientific Teaching Course

Yale Science Diplomats

Outreach

Advocacy

Teaching fellows

Teaching certificates
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
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

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

- Career development workshops through YPPDO (Yale Physics Professional Development Organization)
  - https://yppdo.yale.edu/ and 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
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 IN ASTRONOMY AT Yale
Why Yale Astronomy for your Ph.D.?

Plenty of resources for research and a supportive intellectual community.
ACCESS TO WORLD-CLASS OBSERVING FACILITIES

We have excellent resources for observing, including on-campus observing facilities and telescope-time reserved specifically for our department members.

- Keck: 24 nights per year
- Palomar; 1/8 share
- SDSS V: full partnership
EASY-ACCESS HIGH PERFORMANCE COMPUTING FACILITIES

The Yale Center for Research Computing (YCRC) provides HPC resources freely available for all students to use.
GUARANTEED FUNDING

Teaching beyond the University requirements is optional to earn some extra cash, but your main funding as a researcher is secure for 5 years.

SUPPORTIVE COMMUNITY

A fun and supportive graduate student community. Class of ~4-5 students admitted each year, and a total of ~25-30 students in the entire program.
A WIDE RANGE OF RESEARCH INTERESTS ACROSS FACULTY MEMBERS

For listing of faculty by research interest see: https://astronomy.yale.edu/research

EXOPLANETS
GALAXY EVOLUTION
COSMOLOGY
STAR FORMATION
SOLAR AND STELLAR ASTROPHYSICS
...AND MORE

Students complete 2 short research projects in their first two years before beginning PhD research. This allows for a fuller exploration of research opportunities.
STRUCTURE OF THE GRADUATE PROGRAM

FIRST 2 YEARS

- 10 courses + 2 research projects (1 observational / experimental, 1 theory)
- 4 Semesters as Teaching Assistant (required)
- 1 Professional Development Seminar (taught every semester during PhD)

END OF 2ND YEAR

Ph.D. Qualifying Exam

1. Written exam on general knowledge of astronomy aligned with coursework detailed to the left
2. Oral exam on proposed PhD project

YEARS 3+

- PhD research
- 1 semester as Teaching Assistant (required)
- Yearly progress committee meetings, dissertation progress reports
CURRENT WEEKLY ASTRONOMY EVENTS

Weekly activities are open to all department members

- Astronomy Colloquium
- Galaxy Lunch
- Stellar Astrophysics Journal Club
- Exoplanets and Stars Seminar
- Data Science x Astro Seminar (bi-weekly)
- IDEAS (Inclusivity, Diversity, & Equity in Astro) Journal Club
PLEASE COME JOIN US!

- Are you curious to learn and figure things out?
- Do you have desire for mastery and for learning new ways of problem-solving?
- Do you have core competence in foundational material—physics and mathematics?
- Have you had exposure to research methods and experience with research project, if opportunities were available?
- Do you have the capacity to deal with the ups and downs that are part of long-term intellectual learning?
- Do you have enthusiasm for research?
- Are you excited to belong to a scientific community working on cutting-edge problems?
ASTRONOMY EDUCATION AND OUTREACH CENTER:

- Weekly Public Nights - planetarium shows, public observing
- Summer Research for High School Students (YSPA)
- Weekly area school group visits
- Teaching experience for grad/undergrad students
- Astro 1xx lab exercises
- Astronomy Department Events
FOR MORE INFORMATION....

VISIT OUR WEBSITE AT:
ASTRONOMY.YALE.EDU

https://www.facebook.com/YaleAstro

https://www.instagram.com/yaleastronomy/