

# FRANCESCA FERNANDES

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## EDUCATION

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<b>California Institute of Technology</b> ( <i>expected</i> )	2026 – 2031
PhD, High-Energy Theoretical Physics	Pasadena, CA
<b>Oxford University - Rhodes Scholar</b>	2025 – 2026
Graduate study in Philosophy of Physics	Oxford, UK
<b>Stanford University</b>	2021 – 2025
Physics, B.S. w/ Honors; minor in Math - <i>3rd-Year Physics/Math GPA: 4.02</i>	Stanford, CA

## PUBLICATIONS

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### Peer-Reviewed

1. **F. Fernandes**, M. Marcolli. 2025. *Formal languages, spin systems, and quasicrystals*. Journal of Geometry and Physics.<sup>†</sup>
2. L. Dixon, C. Duhr, **F. Fernandes**, V. Mishnyakov. 2026. *Antipodal Self-Duality beyond Square Fishnets*. In progress.<sup>†</sup>

### Preprints

3. **F. Fernandes**. 2025. *On Applications of the Antipodal Duality*. [Note this is my honors thesis.]

<sup>†</sup> authors listed alphabetically

## HONORS & AWARDS (*acceptance rates starred*)

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### External Fellowships

1. **NSF Graduate Research Fellowship**, < 10%\* (*declined for Rhodes*) 2025
2. **Rhodes Scholarship**, < 1%\* 2024
  - Featured in [Stanford Report](#), [ABC News](#), [Associated Press](#), [US News](#), etc
3. **Marshall Scholarship**, < 3%\* (*declined*) 2024
  - Awarded for two years of study at Oxford and Cambridge
4. **Perimeter Institute Research Fellowship**, < 2%\* (*declined*) 2024
  - Selected as 1 of 2 US interns, and 1 of 10 worldwide
5. **California Institute of Technology Research Fellowship**, < 5%\* 2023
  - Awarded the Carl F. Braun scholarship, worth \$9500
6. **University of Chicago Research Fellowship**, < 5%\* (*declined*) 2023

### Other

7. **Invited Speaker, TriO Program** (*recurrent*) (*funded by Department of Energy*) 2024
  - Gave hour-long talks to first-gen. low-income high-school girls about pursuing physics

## SCIENTIFIC PRESENTATIONS

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### Conference Posters (*3 total*)

- APS Conference for Undergraduate Women in Physics (x2) 2024, 2023
- Stanford Research Conference 2023

### Research Talks (*8 total*)

- Senior Thesis Presentations 2025
- CA Amplitudes Meeting 2025
- Honors Thesis Presentation 2025
- SLAC Theory QCD and Amplitudes Journal Club (1 hour) 2024
- Caltech Summer Research Symposium 2023
- Stanford Physics Summer Research Symposium 2022
- Stanford Physics, Identity, and Equity Program Symposium 2022
- International GASKAP-HI Collaboration Monthly Meeting (virtual) 2022

### Scientific Talks (*9 total*)

- Physics 450 Course (1 hour) (*on double copy and cosmological correlators*) 2024
- Physics 191 Course (*on the stability of Bismut-flat manifolds + stringy applications*) 2024
- Biophysics 241 Course (*on electrostatic preorganization in enzymes*) 2023
- Stanford SPLASH Symposium 2023
- Stanford Mathematical Organization Symposium (x2) 2022
- Stanford Kavli Institute for Astrophysics Tea Talk 2022
- Stanford Mathematics Directed Reading Program Symposium (x2) 2022

## ACTIVITIES

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### Teaching and Outreach

1. **Stanford SPINWIP**, *Counselor, Organizer* July 2024 - present
  - Led 1.5 hour sections daily on topics in physics and programming for 10 high-school girls
  - Gave 75-minute Python lectures weekly to 150 high-school girls
  - Hosted daily office hours on research in physics, emailing professors, etc
  - Coordinated all daily lectures and faculty talks; selected program participants
2. **Physics Undergraduate Women and Gender Minorities**, *Mentor* Summer 2023
  - Fostered a support network for 10 female physics undergraduates
  - Led biweekly discussions on inclusivity, diversity, future paths in physics, and more
3. **Stanford SPLASH**, *Teacher - Quantum Mechanics* May 2022
  - Taught quantum mechanics, requiring only algebraic knowledge, to 50 high-schoolers
  - Created own course notes, worksheets, etc
4. **Nothin' but Space**, *Podcast Host* May 2021 - Feb 2022
  - Hosted a weekly solo [podcast](#) on topics in astrophysics,
  - Ranked No. 24 on Apple Podcasts
  - Interviewed on the [Stanford Daily](#)

## Professional Activities

5. **Physics Undergraduate Society, *Co-President*** Sep 2023 - June 2025
  - Organizes weekly bonding events for physics majors, including study nights, BBQs, etc
  - Spearheaded graduate directed reading program, graduate mentorship program for undergraduates, and outreach to under-resourced high schools
  - Quadrupled the number of women on the officer team—from 1 (myself) to four—a record-breaking amount in the club’s history
6. **Physics Undergraduate Studies Committee, *Member*** Sep 2023 - June 2024
  - Selected as 1 of 2 undergraduates on the committee
  - Helped create Physics 43E, which provides additional support for underresourced students studying introductory electricity and magnetism
  - Helped restructure the introductory lab series
7. **Physics Diversity, Equity, and Inclusion Committee, *Member*** Sep 2022 - June 2023
  - Selected as the sole undergraduate on the committee
  - Helped organize a monthly Black in Physics seminar series
  - Rallied for gentler exam policies w.r.t students having COVID
8. **Mathematics Directed Reading Program, *Participant*** Jan - Sep 2022
  - Studied topics in mathematical physics, including p-adic number theory in string theory
  - Wrote quarterly expositional papers

## GRADUATE COURSEWORK

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### At Stanford (*8 total*):

Biophysics, General Relativity, Quantum Field Theory (A+), Advanced Quantum Field Theory (A+), Black Holes and Quantum Information (A+), Cosmic Inflation and String Theory, Quantum Information Theory and Many-Body Physics, Worldsheet String Theory

### At Oxford (*5 total*):

Philosophy of Quantum Mechanics, Philosophy of Thermodynamics and Statistical Mechanics, Philosophy of Special Relativity, Philosophy of General Relativity, Philosophy of Science