

Alvaro Martinez

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EDUCATION

Columbia University

PhD in Mathematics

(May 2025)

New York, NY

- MPhil (2023), Peter and Katherine Klein Fellow (2022), MA (2021)

University of Cambridge

Master of Advanced Study (Part III) in Mathematics

May 2019

Cambridge, UK

Imperial College London

BS in Mathematics

June 2018

London, UK

- Ken Allen Prize (awarded to top five graduating students)
- Winton Capital Prize (awarded to best team project)

EXPERIENCE

Columbia University Department of Mathematics

August 2019 – Present

PhD Candidate

- Developed a Python package for SageMath introducing new specialized classes and coloring algorithms, advancing research in topological models
- Pioneered an algorithmic approach that reduced time complexity from super-exponential to exponential, achieving an over 2.5x expansion in computational range over existing methods
- Presented research papers to expert audiences at international conferences

Instructor

- Created a comprehensive linear algebra course, integrating active learning and software tools (MATLAB)
- Co-directed a research program on applications of topology to quantum error-correcting codes

Directed Reading Program

September 2020 – Present

Program Lead

- Initiated and managed a mentorship program, which grew to involve over 150 students and graduate mentors

Science Honors Program

January 2020 – May 2023

Course Developer

- Developed courses for high-achieving high school students, focused on graduate topics and problem-solving
- Designed interactive JavaScript tools and used Jupyter Notebooks to illustrate complex mathematical concepts

SKILLS

- **Programming Languages:** Python, SageMath, HTML/CSS/JavaScript, C++, SQL, MATLAB, Mathematica
- **Frameworks and libraries:** Flask, NumPy, Matplotlib, Pandas, React, D3.js, Git
- **Languages:** English (fluent), Spanish (fluent), Catalan (fluent), French (proficient)

INTERESTS

- Classically trained jazz guitarist (led a jazz quintet, co-organized a big band), vegan cooking, pickleball