EMILY LOPEZ

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EDUCATION

University of Minnesota-Twin Cities September 2024 - Present
PhD in Applied Mathematics
Relevant Coursework: Probabilistic Modeling and Computation, Numerical Analysis I, Numerical PDE, Theory of PDE I/II, Functional Analysis & Harmonics, Real Analysis with Measure Theory, Differential Topology

Cornell University August 2022 - August 2024
PhD in Applied Mathematics (2 years completed)
Relevant Coursework: Mathematical Statistics, Statistical Principles, Measure Theory, Inverse Problems, Stochastic Processes, Probability, Dynamical Systems.

University of California, Santa Barbara September 2018 - June 2022
College of Creative Studies
B.S. in Mathematics with honors
Overall GPA: 3.73

College of the Canyons Community College June 2018
A.S. in Mathematics
Summa cum laude; Overall GPA: 4.0

RESEARCH EXPERIENCE

University of Minnesota May 2025 - Present
Independent Reading under Professor Li Wang *Minneapolis, MN*

– Self-studying fundamentals to optimal transport based on Filippo Santambrogio's text *Optimal Transport for Applied Mathematicians* in preparation for my research.

Cornell University March 2024 - August 2024
Graduate Research Assistant for Dr. Christina Lee Yu *Ithaca, NY*

– Investigated graph agnostic estimators for the total treatment effect, a key estimand in causal inference, in setting where interference is present.
– constructed unbiased estimation methods that take advantage of sampling at more stages to compensate for observation noise without requiring knowledge of the network.
– Mentored two undergraduate on coding simulations and creating public experimental repository for the causal inference community.

Cornell University March 2023 - January 2024
Graduate Research Assistant for Dr. Jamol Pender *Ithaca, NY*

– Studied the dynamics of $M/M/c$ queueing system with priority discipline to gain insight in ways to control contact exposure in waiting systems.

UCSB Mathematics Department August 2020 - June 2022
Research Assistant for Dr. Katy Craig *Goleta, CA*

– Completed independent reading course on *Computational Optimal Transport* by Peyré and Cuturi.
– Study the relationship between the linearized optimal transport (LOT) distance and 2-Wasserstein distance by investigating inequalities relating the metrics and numerically classifying their sharpness using Python.

Williams College SMALL Math REU June 2020 - August 2020
Research Assistant for Dr. Joshua Carlson *Williamstown, MA*

– Worked in group of five students to extend the throttling parameter to directed graphs; one paper published.
– Discovered the fullness of the orientation throttling interval of a simple graph, provided a characterization of throttling numbers of directed graphs, and explored bounds for throttling number of paths with arcs alternately directed.

UCSB EUREKA Scholar June 2019 - August 2019
Undergraduate Researcher in Dr. Francesco Bullo's Lab *Goleta, CA*

– Studied algebraic graph theory and discrete-time averaging systems.
– Examined the behavior of human's opinions by simulating the Affine Boomerang Model on various network structures using MATLAB.
– Participated in weekly training on scientific communication; semi-finalist in Summer Undergraduate Research Slam.

UCSB Math Directed Reading Program Participant January 2019 - June 2019
Studied under Marcos Reyes *Goleta, CA*

– Self-studied knot invariants (e.g., tri-colorability, reidemeister moves, Jones polynomial) to characterize knots.
– Met weekly with mentor to discuss reading and problem sets, which would be composed into a final poster presentation.

Summer Institute in Math and Science (SIMS) Scholar August 2018
Center for Science and Engineering Partnerships *Goleta, CA*

– Participated in a 2-week program geared toward preparing first-year underrepresented STEM students for research opportunities at UCSB.
– Used magnetometer to determine conditions in which the superconductor yttrium barium copper oxide is diamagnetic using the coolant, liquid nitrogen.
– Attended courses in linear algebra, physics, and writing in preparation for coursework at UCSB.

EMPLOYMENT

SIMS Student Coordinator December 2020 - September 2021
Center for Science and Engineering Partnerships *Goleta, CA*

Coordinated the SIMS team to create a 3-week intensive summer program that prepares underrepresented UCSB students entering directly from high school for STEM research. Worked 8-15 hours a week before the program and full time (40 hours per week) for the three weeks of SIMS. Some duties included:

– Recruiting and reviewing applications for Peer Mentors and SIMS scholars' selection
– Leading weekly meetings with the CSEP staff, graduate students, and instructors to create programming and voice students' needs
– Managing and updating the SIMS website and recruitment fliers

- Collaborating with UCSB campus resources and industry personnel for training and workshops
- Hosting office hours for one-on-one mentoring with students
- Moderating student networking events with graduate students, faculty, and industry
- Notifying SIMS interns of research opportunities and scholarships through weekly mailers
- Writing executive summary and exit survey report

PUBLICATIONS

1. E. Cairncross, J. Carlson, P. Hollander, B. Kitchen, E. Lopez, and A. Zhuang, Throttling for standard zero forcing on directed graphs, 2020. Australasian Journal of Combinatorics.

WORKSHOPS AND SUMMER SCHOOLS ATTENDED

Optimal Transport Summer School July 2025
UC Santa Barbara *Goleta, CA*

- Week long summer school covering modern optimal transport theory, ranging from statistical estimation of Wasserstein distances, the dynamical formulation of OT, linearized optimal transport, to measure valued regression using Wasserstein barycenters.

AMIGA's Program July 2023
Institute for Pure and Applied Mathematics, UCLA *Los Angeles, CA*

- AMIGAs is a week-long summer program for incoming second or third year students in graduate programs in the USA, designed to support and train a new generation of mathematical scientists in applied and computational mathematics, with a special emphasis on increasing the number of women, particularly those from historically excluded racial groups, in both academia and industry.

EDGE for Women Program July 2022
Oxford University *Oxford, UK*

- The EDGE for Women Summer Program is an intensive 4-week summer program at Oxford University which provides first-year PhD students graduate-level math preparation and a support network of women at various stages in their careers.

AWARDS AND FELLOWSHIPS

2025 Lathism Hispanic Heritage Month Honoree

2022 Thomas More Storke Award for Excellence

- UCSB's highest student honor in recognition of outstanding scholarship and extraordinary service to the university, its students, and the community.

2022 Jo Little Memorial Scholarship

- Scholarship are awarded annually to two outstanding undergraduate students who exemplify academic excellence and service to the community, one from the College of Creative Studies and one from Environmental Studies.

2022 NSF Graduate Research Fellowship

- Distinguished fellowships to outstanding students in science, technology, engineering, and mathematics (STEM) disciplines to support their pursuit of research-based graduate degrees. Awarded to support my proposed project on "A Comparison of the Linearized Optimal Transport and 2-Wasserstein Distance".

2022 & 2027 Cornell Colman Fellowship (Declined for 2027)

- 2-year fellowship designed to broaden representation and develop future engineering leaders.

Cornell University Deans Scholar

- Prestigious distinction aimed at developing a diverse community of scholars through which connections are established and maintained across all graduate fields.

2022, 2021, & 2020 Edison Scholarship

- Scholarship supporting research activities during the academic year.

2021 & 2020 UCSB Mathematics Department Ostrow Bruckner Scholarship

- Annual Scholarship given to an outstanding Junior Math major. Won for both my Sophomore and Junior year.

Ronald E. McNair Research Scholar

- The McNair Scholars Program prepares qualified undergraduates for entrance to graduate programs in all fields of study.

2021 Joint Mathematics Meeting (JMM) Outstanding Poster Award

- Awarded for "Throttling for standard zero forcing on directed graphs"

Qualcomm MESA University Program Scholarship

- Diversity Scholarship for outstanding Latinx STEM majors.

CCS Traveling Undergraduate Research Fund

- Support to attend 2019 SACNAS National Diversity Conference.

TALKS AND POSTER PRESENTATIONS

Exploiting Additional Measurements in staggered Rollout Designs for Graph Agnostic Estimators under Network Interference

- 2025 Joint Mathematics Meeting AMS EDGE Session

A comparison of the LOT and the 2-Wasserstein distance

- 2022 Phi Sigma Rho Women in STEM Sorority General Body Meeting (talk)
- 2021 McNair Scholars Conference and Symposium (talk)

Throttling for standard zero forcing on directed graphs

- 2021 Joint Mathematics Meeting (poster)
- 2021 Nebraska Conference for Undergraduate Women in Mathematics (talk)
- 2020 McNair Summer Research Symposium (talk)
- 2020 Northeastern Mathematics REU Virtual Conference (talk)

Modeling opinion dynamics using the Affine Boomerang Model

- 2019 SACNAS National Diversity Conference (poster)
- 2019 UCSB Undergraduate Research Colloquium (poster)
- 2019 Center for Science and Engineering Partnerships Research Program Symposium (talk)

SERVICE TO THE FIELD

EDGE for Women Webinar Series Co-organizer — September 2023 - Present
EDGE Foundation — *Online*

EDGE for Women Reunion Panel — June 2023
Brown University — *Providence, RI*

"After Undergrad" Senior Panelist — May 2022
Association for Women in Mathematics — *Goleta, CA*

Founding Member of Pacific Math Alliance Chapter — August 2020 - June 2022
UCSB — *Goleta, CA*

Mentor for AWM Mentoring Program — March 2020 - June 2020
Association for Women in Mathematics — *Goleta, CA*

SERVICE TO THE INSTITUTION

GeMM Graduate Fellowship Panel — October 2024
University of Minnesota Mathematics Department — *Minneapolis, MN*

DPE Graduate Student Panel — June 2023
Cornell University — *Goleta, CA*

UCSB McNair Scholars Program "Year 1 of Grad School" Panel — May 2023
UCSB — *Goleta, CA*

American Association of University Women Leadership Conference — June 2023
University of Maryland, College Park — *College Park, MD*

Expanding Your Horizons Workshop Volunteer — April 2023
Cornell University — *Ithaca, NY*

Undergraduate Representative for the CCS Lounge Event (Webinar) — October 2020
College of Creative Studies, UCSB — *Goleta, CA*

Member of the Student Diversity, Equity, and Inclusion Committee — July 2020 - June 2021
College of Creative Studies, UCSB — *Goleta, CA*

Mentor for Freshman Mentorship Program — September 2020 - June 2022
College of Creative Studies, UCSB — *Goleta, CA*

Undergraduate Chapter Vice President — July 2019 - June 2020
UCSB SACNAS — *Goleta, CA*

Undergraduate Research Panelist — April 2020
MESA Science and Technology Day — *Goleta, CA*

Undergraduate Researcher Panelist — January 2020
Center for Science and Engineering Partnerships — *Goleta, CA*

PROFESSIONAL AFFILIATIONS

EDGE for Women in Math

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)

American Mathematical Society (AMS)

Association for Women in Mathematics (AWM)

Society for Industrial and Applied Mathematics (SIAM)