Amelia Gibbs

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Education

UC San Diego — San Diego, CA
Ph.D. in Mathematics — 2025 – Present

Trinity University — San Antonio, TX
B.A. in Mathematics — 2021 – 2025

Research Experience

University of Michigan - Dearborn — Dearborn, MI
Research Assistant; Advisor: Kelly Jabbusch — Summer 2024
Worked jointly with three other undergraduates to study error-correcting codes from toric varieties and geometric invariants of lattice polytopes

- Developed a new method for computing the minimum distance of toric codes associated to certain classes of lattice polygons
- Proved results regarding the affects of polytope operations on the Minkowski Length, a geometric invariant, of a lattice polytope

Trinity University — San Antonio, TX
Research Assistant; Advisor: Hoa Nguyen — Summer 2023
Optimized the method of images for regularized Stokeslets using theoretical and experimental results of spherical motion near a boundary

- Simulated spherical motion near a boundary at low Reynolds number with the method of images for regularized Stokeslets in MATLAB
- Developed approximations for optimal numerical parameters of various regularization functions from simulation data

Publications

- Amelia Gibbs, Eliza Hogan, Kelly Jabbusch, Jenna Plute, and Nicholas Toloczko. 2025. *"Toric Surface Codes and the Periodicity of Polytopes."* arXiv:2509.21178. Preprint, arXiv. Submitted.
- Hoa Nguyen, Amelia Gibbs, Frank Healy, Orrin Shindell, Ricardo Cortez, Kate Brown, Jonathan McCoy, and Bruce Rodenborn. *"Optimizing the Method of Images for Regularized Stokeslets Using Theory and Experiments of Spheres Moving near Boundaries."* Physical Review Fluids 10(3):033101, March 15 2025. doi:10.1103/PhysRevFluids.10.033101.
- Amelia Gibbs, and Brian K. Miceli. *"Two Combinatorial Interpretations of Rascal Numbers."* Journal of Integer Sequences 27(8):21, November 12 2024. Article 24.8.2.

Presentations

- *"A Combinatorial Proof of Schläfli's Identity and Gould's Identity,"* CombinaTexas, April 2025, Texas A&M University, Contributed Talk.
- *"Toric Surface Codes and the Periodicity of Polytopes,"* Joint Mathematics Meetings, January 2025, Seattle WA, Contributed Talk, Presented Jointly.
- *"A Combinatorial Proof of Schläfli's Identity and Gould's Identity,"* AMS Fall 2024 Central Sectional Meeting, September 2024, University of Texas - San Antonio, Invited Talk.
- *"Toric Surface Codes and the Periodicity of Polytopes,"* Young Mathematicians Conference, August 2024, Ohio State University, Contributed Talk, Presented Jointly.
- *"Toric Surface Codes and the Periodicity of Polytopes,"* SUMMR, July 2024, Michigan State University, Contributed Talk, Presented Jointly.
- *"Two Combinatorial Interpretations of Rascal Numbers,"* CombinaTexas, March 2024, Texas A&M University, Contributed Talk.
- *"Calibration of the method of images for regularized Stokeslets using sphere motion near a boundary,"* APS Division of Fluid Dynamics 76th Annual Meeting, November 2023, Washington DC, Poster Presentation.

Awards

Junior Mathematics Award Trinity University, 2024
Given to the junior whose performance and promise in mathematics are deemed the best by the mathematics faculty at Trinity

Teaching Experience

UC San Diego San Diego, CA
Tecahing Assistant 2025 – Present
Courses TA'd: Calculus II (Math 10B)

Trinity University San Antonio, TX
Teaching Assistant 2023 – 2025
Courses TA'd: Linear Algebra (Math 3323), Combinatorics (Math 3343), Modern Algebra (Math 3362), and Applied Linear Algebra (Math 3319).

Training
Teaching Assisant Training UC San Diego, 2025
Math Peer Educator Trinity University, 2023

References

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Professor
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Trinity University
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Hoa Nguyen, PhD
Professor
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Trinity University
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Kelly Jabbusch, PhD
Associate Professor
Department of Mathematics and Statistics
University of Michigan
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