


Madeleine E. Goertz

Curriculum Vitae

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EDUCATION

California Polytechnic State University , San Luis Obispo, CA	Sept. 2021 – June 2025
Master of Science in Mathematics	GPA: 4.0/4.0
Advised by Patrick Orson, writing Master's Thesis <i>On the Smale Conjecture</i>	
Bachelor of Science in Mathematics	GPA: 4.0/4.0
Advised by Eric Brussel, wrote Senior Project <i>On Moduli Spaces of Triangles</i>	
Joint BS/MS Program. Member of University Honors Program, Association for Women in Mathematics	

PREPRINTS & PUBLICATIONS

3. The Quaternary Gray Code and How It Can Be Used to Solve Ziggurat and Other Ziggu Puzzles. (with A. Williams). arXiv:2411.19291. (preprint).
2. The Stack of Triangles Up to Similarity. (with E. Brussel, E. Guptill, & K. Lyle). arXiv:2408.07792. (preprint).
1. The Torus of Triangles. (with E. Brussel). arXiv:2303.11446. (to appear in *Involve*).

AWARDS & SCHOLARSHIPS

Charles J. Hanks Excellence in Mathematics Scholarship	May 2024
<i>Awarded to the top student in the Cal Poly math department.</i>	
Frost Research Scholarship	Sept. 2022 – June 2025
<i>College of Science and Math Award to support research, \$10,000 per year for 3 years. Part of inaugural cohort of scholars.</i>	
First place, Physical & Mathematical Sciences, 37th Annual CSU Student Research Competition	Apr. 2023
<i>California State University system-wide competition for 10-minute research talk to a general audience.</i>	
Frost Summer Undergraduate Research Scholarship	June 2022 & June 2023
<i>Stipend to support summer research. \$4,500 per summer for two summers.</i>	
Michael Hushour Scholarship	May 2024
Bryant Russel Memorial Award	May 2024
First place, Cal Poly Three Minute Thesis Competition	Feb. 2024
Cal Poly Bailey College of Science and Mathematics Standout Student	Nov. 2023
Women in STEM Scholarship	May 2023
Advancement of Science & Technology Scholarship	May 2023
Edward Van Duyne Memorial Scholarship	May 2022
Math and Science Teacher Initiative Initial Scholarship	Sept. 2022

RESEARCH PROGRAM PARTICIPATION

NSF SMALL REU, <i>Williams College</i>	Summer 2024
Advised by Aaron Williams, on <i>Combinatorial Algorithms & Hamilton Paths</i>	
Frost Summer Undergraduate Research Program, <i>Cal Poly</i>	Summer 2023
Advised by Eric Brussel, on <i>Moduli Space of Triangles</i>	
Frost Summer Undergraduate Research Program, <i>Cal Poly</i>	Summer 2022
Advised by Eric Brussel, on <i>Poncelet's Theorem</i>	

RESEARCH COMMUNICATION

Talks for Mathematical Audiences

3. "Moduli Space of Triangles & Euclid's Similarity Theorems." (with E. Brussel, E. Guptill, & K. Lyle). AMS Contributed Paper Session on Geometry, *Joint Mathematics Meetings*, San Francisco, CA. Jan. 2024.
2. "Geometry of the moduli spaces of similarity classes of triangles defined by three classical theorems." (with E. Brussel, E. Guptill, & K. Lyle). *2nd CSU Mathematical Sciences Conference*, Bakersfield, CA. Nov. 2023.
1. "Poncelet Families & The Torus of Triangles." (with E. Brussel). *1st CSU Mathematical Sciences Conference*, Northridge, CA. Nov. 2022.

Talks for General Audiences

6. “A Moduli Space of Triangles.” (with E. Brussel). *4th Annual CSU Grad Slam*, Virtual Meeting. May 2024.
5. “A Moduli Space of Triangles.” (with E. Brussel). *Western Association of Graduate Schools 8th Annual Regional Three Minute Thesis Competition*, Virtual Meeting. Mar. 2024.
4. “A Moduli Space of Triangles.” (with E. Brussel). *Cal Poly Three Minute Thesis Competition*, San Luis Obispo, CA. Feb. 2024.
3. “The Torus of Triangles.” (with E. Brussel). *Cal Poly College of Science and Mathematics Research Conference*, San Luis Obispo, CA. May 2023.
2. “The Torus of Triangles.” (with E. Brussel). *37th Annual CSU Student Research Competition*, San Diego, CA. Apr. 2023.
1. “The Torus of Triangles.” (with E. Brussel). *Cal Poly CSU Student Research Competition*, San Luis Obispo, CA. Feb. 2023.

Poster Presentations

4. “Three Moduli Spaces of Triangles.” (with E. Brussel, E. Guptill, & K. Lyle). *Bailey College of Science and Mathematics 2024 Student Research Conference*, San Luis Obispo, CA. May 2024.
3. “Three Moduli Spaces of Triangles.” (with E. Brussel, E. Guptill, & K. Lyle). *Cal Poly Summer Undergraduate Research Symposium*, San Luis Obispo, CA. Oct. 2023.
2. “Three Moduli Spaces of Triangles.” (with E. Brussel, E. Guptill, & K. Lyle). *Mathematics Department Summer Research Poster Symposium*, San Luis Obispo, CA. Oct. 2023.
1. “Poncelet Families & The Torus of Triangles.” (with E. Brussel). *Mathematics Department Summer Research Poster Symposium*, San Luis Obispo, CA. Oct. 2022.

TEACHING EXPERIENCE

Teaching experience as a graduate teaching associate and instructor of record.

Math 118: Precalculus, *Cal Poly* Fall 2024, Winter 2025

OTHER WORK EXPERIENCE

Mathematics Tutor, *Cal Poly Learning Support Center* Oct. 2023 – June 2024
Grader, *Cal Poly Department of Mathematics* Jan. 2023 – June 2023
Learning Assistant, *Cal Poly Department of Physics* Apr. 2022 – June 2022
Coding Camp Instructor, *Coding with Kids LLC* June 2019 – Sept. 2021

CONFERENCE & COMPETITION ATTENDANCE

Bailey College of Science and Mathematics Student Research Conference, *San Luis Obispo, CA* May 2024
4th Annual CSU Grad Slam Competition, *Virtual* May 2024
8th Annual Western Association of Graduate Schools Regional 3-Minute Thesis Competition, *Virtual* Mar. 2024
2024 Joint Mathematics Meetings, *San Francisco, CA* Jan. 2024
2nd CSU Mathematical Sciences Conference, *Bakersfield, CA* Nov. 2023
Cal Poly College of Science and Mathematics Research Conference, *San Luis Obispo, CA* May 2023
37th Annual CSU Student Research Competition, *San Diego, CA* Apr. 2023
2023 Joint Mathematics Meetings, *Boston, MA* Jan. 2023
1st CSU Mathematical Sciences Conference, *Northridge, CA* Nov. 2022

LEADERSHIP & INVOLVEMENT

Member, *Cal Poly Math Club* Sept. 2021 – Present
Member, *Cal Poly Association for Women in Mathematics Chapter* Sept. 2021 – Present
Ambassador, *Cal Poly University Honors Program* Feb. 2023 – June 2024

SKILLS

Technical: Mathematica, Java, Python, R, Git.

Nontechnical: English, German, Mathematics Communication.