

# Jennifer Vaccaro

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## EDUCATION

<b>University of Illinois at Chicago (UIC)</b> <i>PhD in Mathematics (expected 2025), MS in Mathematics (May 2022)</i> • Thesis project: Deformations and boundary structure of Anosov triangle groups in $SL(3, C)$ • Research interests: hyperbolic geometry, representations into Lie groups, and math visualization software	2020 – present Chicago, IL
<b>Olin College of Engineering</b> <i>B.S in Electrical and Computer Engineering</i>	2013 – 2017 Needham, MA

## EXPERIENCE

<b>Graduate Researcher, Los Alamos National Laboratory</b> <i>X-Computational Physics Division, Methods and Algorithms</i> • Researched math problems related to Arbitrary Lagrangian-Eulerian hydrodynamics and swept face remap.	Summer 2022 Los Alamos, NM
<b>Graduate Teaching Assistant and Research Assistant, UIC</b> <i>Department of Mathematics, Statistics, and Computer Science (MSCS)</i> • Served as TA for Python computer science courses, differential equations, and calculus. • Earned 2023 Award for Graduate Research Award and 2021 MSCS Teaching Assistant Award. • Organizer and advisor for UIC undergraduates in the COMAP MCM/ICM modeling competition.	2020 – present Chicago, IL
<b>Software Engineer, Woods Hole Oceanographic Institution</b> <i>Deep Submergence Laboratory, AUV Sentry and ROV Jason</i> • Projects included robotic path-planning algorithms, multibeam sonar control software, device drivers, data post-processing tools, and user interfaces. Coded in Python, C++, and MatLab with ROS and Qt. • Supervised projects for an entry-level engineer and an undergraduate intern.	2017 – 2020 Woods Hole, MA
<b>Undergraduate Researcher, Fairfield University</b> <i>REU for Mathematics and Computational Science</i> • Computed lower volume bounds for hyperbolic 3-orbifolds.	Summer 2015 Fairfield, CT

## PUBLICATIONS

- Vaccaro, J., Lipnikov, K., *Applying an Oriented Divergence Theorem to Swept Face Remap*. SIAM Journal on Numerical Analysis, Volume 61, Issue 5, October 2023, Pages 2285-2304. ([siam.org link](https://arxiv.org/abs/2305.12345))
- Atkinson, C., Mallepalle, J., Melby, J., Rafalski, S., Vaccaro, J., *Guts and volume for hyperbolic 3-orbifolds with underlying space  $S^3$* . Topology and its Applications, Volume 243, 1 July 2018, Pages 100–113. ([arxiv.org link](https://arxiv.org/abs/1805.12345))
- Vaughn, I., Suman, S., Berkowitz, Z., Vaccaro, J., et al. *Upgrading to ROS at 6000m*. IEEE AUV, November 2018. ([ieee.org link](https://ieeexplore.ieee.org/abstract/document/8567890))

## PRESENTATIONS

- Applying an Oriented Divergence Theorem to Swept Face Remap* (Los Alamos National Laboratory)  
• **Mathematics winner**, Los Alamos Student Research Symposium 2022
- Guts and volume estimates for hyperbolic 3-orbifolds with underlying space  $S^3$*  (JMM 2016, WiMiN 2015)
- Applying Computer Modeling to Post-Silicon Electrical Validation* (IEEE/ACM ICCAD 2017)  
• **2nd place**, ACM/Microsoft Research Student Research Competition Grand Finals ([acm.org link](https://arxiv.org/abs/1705.12345))  
• **1st place**, ACM/Microsoft Research Student Research Competition at ICCAD
- UIC Graduate Geometry, Topology, and Dynamics Seminar  
• *Symmetric patterns of geodesics and automorphisms of surface groups* (September 2022)  
• *Projective bending* (April 2022)  
• *Convex cocompact representations into  $Isom(H^n)$*  (March 2022)  
• *Flag manifolds and balanced ideals* (October 2021)