

Danielle Barquinero

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EDUCATION

- **University of Iowa** Iowa City, Iowa
PhD in Mathematics (in progress), Advisor: Mohammad Farajzadeh-Tehrani Aug 2021 - Present
- **Florida State University** Tallahassee, Florida
Bachelor of Science in Pure Mathematics, Minor in Computer Science Aug 2018 - Dec 2020

SKILLS SUMMARY

- **Mathematical Interests:**
 - **Topology/Geometry:**
 - Specific knowledge in various Floer homologies in dimension three and complex geometry in dimension four.
 - Dynamics on manifolds and geometry of moduli spaces of J-holomorphic curves in symplectizations.
 - Riemannian geometry, hyperbolic geometry, metric spaces of nonpositive curvature.
 - Knot theory and its use in various topological invariants in low dimensions.
 - **Algebra:**
 - Infinity Categories and higher structures as used in low-dimensional topology.
 - Sheaf theory and basic algebraic geometry
 - **Graph Theory:**
 - Experience creating graphs in various visualization software.
 - Research experience in applications of graph theory to topology.
- **Programming Languages and Tools:** C++, Python, Matlab, Julia

EXPERIENCE

- **University of Iowa** Iowa City, IA
Graduate Research Fellow (Intermittently) Aug 2021 - Present
 - **Research:** Conducted independent research, involving reading technical and modern papers in mathematics, traveling to conferences, giving talks to knowledgeable audiences, and proving new results.
 - **Collaboration:** Identified areas for future research topics and discussed viability with professors, post-docs, and graduate students both locally and outside of the University of Iowa
- **University of Iowa** Iowa City, IA
Graduate Teaching Assistant (Intermittently) Aug 2021 - Present
 - **Independent Teaching:** Taught independent sections of Calculus and Precalculus, including developing original lesson plans and assignments.
 - **Teaching Assistant:** Led large discussion sections for large lecture-style courses such as College Algebra and major-specific math prerequisites.
 - **Tutoring:** Tutored individuals in the Mathematics Tutorial Lab for all undergraduate math classes as well as programming-based applied math courses.
- **Florida State University** Tallahassee, FL
Undergraduate Research Assistant Sep 2019 - Jan 2021
 - **Research:** Built up background in abstract algebra and topology. Using novel methods, computed examples for presentations for Artin kernels with the purpose of developing a formula for as wide a class of objects as possible.
 - **Collaboration:** Collaborated on the project with a post-doc at FSU and an industry collaborator in China. Presented research at several undergraduate colloquiums, accepted to speak at an academic and industrial conference (postponed due to COVID)
- **Democratic National Convention** Sioux City, IA
Data Analyst Jul 2018 - Nov 2018
 - **Role:** Founding member, data analysis team for J.D. Scholten's congressional campaign for the U.S. House Iowa District 4.
 - **Research:** Developed a new model in Python for predicting election results using historical and modern voter registration and participation data. This model was used again in 2020 and predicted the election results within 1% in a supermajority of counties.
 - **Technical:** Created applications in Python and Excel for extracting data from the Iowa Secretary of State's website and DNC surveying.

PUBLICATIONS AND ATTENDED CONFERENCES

- **Graphical Splittings of Artin Kernels:** Barquintero, Danielle, Ruffoni, Lorenzo and Ye, Kaidi. “Graphical splittings of Artin kernels” *Journal of Group Theory*, vol. 24, no. 4, 2021, pp. 711-735. DOI
- **Abelian Splittings of Right-Angled Artin Groups and Subgroups:** Barquintero, D. (2020). Abelian Splittings of Right-Angled Artin Groups and Subgroups. Retrieved from DigiNole
- **2023 Georgia Topology Conference:** A five day long conference focusing on spaces of diffeomorphisms, symplectomorphisms, and contactomorphisms in dimensions three and four. (May 2023)
- **Winter School in Singularities and Low Dimensional Topology:** A week long summer school in Budapest focusing on knot theory, lattice cohomology, curve singularities, and Heegaard-Floer homology. (Jan 2023)
- **Graduate school on Geometric Group Theory and Low Dimensional Topology:** An eleven day workshop in Madrid on topics relating to geometric group theory and low dimensional topology. (Apr 2022)
- **Eastern Illinois Integrated Conference in Geometry, Dynamics, and Topology 2020:** Postponed due to COVID
- **Florida State University - UROP Symposium:** A poster board presentation where participants present the work they completed throughout the year in the Undergraduate Research Opportunity Program. Presented work on Artin Kernels. (Apr 2020)