

SHAMUEL AUYEUNG

Trinity College
Department of Mathematics

CONTACT INFORMATION

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EDUCATION

Ph.D., Mathematics, Stony Brook University August 2017 - August 2023
Advisor: Mark McLean
Thesis: Local and Fixed-Point Floer (Co)homologies
B.S., Mathematics with honors, Calvin College September 2012-May 2017
Thesis advisor: Christopher Moseley
B.A., Philosophy with honors, Greek, Calvin College September 2012-May 2017
Thesis advisor: Lee Hardy

TEACHING

Trinity College:

- Math 231 - Multivariable and Vector Calculus, lead instructor Fall 2023

Stony Brook University:

- MAT 132 - Calculus II, TA Spring 2023
- MAT 122 - Overview of Calculus with Applications, TA Fall 2022
- MAT 131 - Calculus I, TA Fall 2021
- MAT 203 - Calculus III with Applications, TA Fall 2020
- MAT 126 - Calculus II, lead instructor Summer 2020
- MAT 122 - Overview of Calculus with Applications, TA Fall 2019
- MAT 123 - Precalculus, TA Fall 2019
- MAT 312 - Applied and Abstract Algebra, lead instructor Summer 2019
- MAT 123 - Precalculus, TA Spring 2019
- MAT 131 - Calculus I, TA Fall 2018
- MAT 118 - Mathematical Thinking, lead instructor Summer 2018
- MAT 123 - Precalculus, TA Spring 2018
- MAT 310 - Linear Algebra with Proofs, TA Fall 2017

Educational Talks (I-STEM High School Program)

- *Complex Numbers, a Counting Problem, and Messy Data* Summer 2022
- *Graph Theory and Error-Correcting Codes* Spring, Summer 2022
- *What is Hamiltonian Mechanics?* Spring 2022
- *Introduction to Group Theory and its Uses* Summer 2021
- *The Pigeonhole Principle* Summer 2019
- *Complex Numbers and Vizualizing Complex Functions* Summers 2018, 2019, 2021

RESEARCH

Current interests: symplectic geometry: Lagrangian and fixed-point Floer (co)homology; algebraic singularities, Lie algebras from almost complex geometry, string topology

Publications and Preprints:

- Shamuel Auyeung, *Adjacent Singularities, TQFTs, and Zariski's Multiplicity Conjecture*. submitted (2023). <https://arxiv.org/abs/2308.13925>
- Shamuel Auyeung, Jin-Cheng Guu, and Jiahao Hu, *On the Algebra Generated by $\bar{\mu}, \bar{\partial}, \partial, \mu$* . *Complex Manifolds* Vol. 10, Iss. 1, (2023). <https://www.degruyter.com/document/doi/10.1515/coma-2022-0149/html>.
- Shamuel Auyeung, *Local Lagrangian Floer Homology of Quasi-Minimally Degenerate Intersections*. To appear in *Journal of Topology and Analysis*, (2023). <https://arxiv.org/abs/2109.03679>.
- Shamuel Auyeung, Joshua Ruiter, and Daiwei Zhang. *An Algebraic Characterization of Highly Connected $2n$ -Manifolds*. *Rose-Hulman Undergraduate Mathematics Journal*: Vol. 17, Iss. 2, Art. 5. <https://scholar.rose-hulman.edu/rhumj/vol17/iss2/5>.
- Shamuel Auyeung and Eric Yu. *The Krein Matrix and an Interlacing Theorem*. *SIAM Undergraduate Research Online Journal* Vol. 7. <https://www.siam.org/publications/siuro/volume-7>.

Academic Talks:

- *Invitation to Topology via Quantum Computing and the Square-Peg Problem*
Trinity College Spring 2023
- *Models for Eilenberg-MacLane Spaces using Symmetric Products*
SBU Graduate Student Seminar Spring 2023
- *Survey of Sheaf Theoretic Approaches to Symplectic/Contact Geometry*
SBU Student Symplectic Seminar Fall 2022
- *Oriented Cobordism, Genera, and the Hirzebruch Signature Theorem*
SBU Student Topology Seminar Fall 2022
- *Adjacencies, Multiplicity, and Fixed-Point Floer Cohomology*
University of Iowa Geometry and Topology Seminar Fall 2022
- *Symplectic Cohomology II: Product Structures, Loop Spaces, and Hochschild Homology*
SBU Student Symplectic Seminar Fall 2022
- *Symplectic Cohomology I: Reeb Dynamics and Viterbo Functoriality*
SBU Student Symplectic Seminar Fall 2022
- *Adjacencies, Multiplicity, and Fixed-Point Floer Cohomology*
Rutgers University: Woodward Research Group Fall 2022
- *Milnor Fibrations, Singularities, and Floer Cohomology*
SBU Research Spotlight Fall 2022
- *$\langle k \rangle$ -Manifolds and Framed Cobordism of Cornered Manifolds*
SBU Floer Homotopy Theory Seminar Spring 2022
- *Framed Cobordism and Thom Spectra*
SBU Floer Homotopy Theory Seminar Spring 2022
- *Incarnations of McKay Correspondences: Representations and du Val Singularities*
SBU Graduate Student Seminar Spring 2022

- *Local Lagrangian Floer Homology of Quasi-Minimally Degenerate Intersections*
Western Hemisphere Virtual Symplectic Seminar Fall 2021
- *Twisted Complexes and Split-Generation for Fukaya Categories*
SBU RTG Seminar on Homological Mirror Symmetry Fall 2019
- *Morse Homology, Hamiltonian Floer Theory, and Arnold's Conjecture*
SBU Graduate Student Seminar Fall 2019
- *The de Rham Groupoid*
SBU RTG Seminar on Higgs Bundles Fall 2018
- *An Introduction to Lie Groups*
Calvin College Math Colloquium Spring 2017
- *Classification of n -Connected $2n$ -Manifolds Via Homotopy Theory*
Calvin College Math Colloquium Spring 2015
- *An Overview of Zorn's Lemma and its Guises*
Calvin College Math Colloquium Spring 2015
- *The Krein Matrix and an Interlacing Theorem*
Calvin College Math Colloquium Fall 2013

FURTHER EXPERIENCE

- Teacher for I-STEM High School Mathematics Program Summers 2018-2022
- Math Learning Center Tutor August 2017 - May 2023
- Mathematics Directed Reading Program Mentor Spring 2021
- Math, Computer Science, and Philosophy Grader at Calvin College August 2013 – May 2015
- CSU Microwaves Magnetics Lab Intern Summer 2012
- CSU Extreme Ultraviolet Laser Lab Intern Summer 2011

SERVICE AND OUTREACH

- SBU Math Day - Session on Hexaflexagons October 2022
- Symplectic Geometry, Low-Dimensional Topology, Gauge Theory Seminar Co-Organizer Fall 2022 - Spring 2023
- RTG Student Seminar Co-Organizer Fall 2019 - Spring 2020
- Tutor for the Calvin Prison Initiative June 2015- May 2017
- Tutor for WEB Program for Under-privileged Students August 2016- May 2017

HONORS AND AWARDS

- Barry M. Goldwater Scholarship August 2015 - May 2016
- NSF REU Fellowship Summers 2013, 2014, 2016
- NSF Scientific Computing Scholarship August 2012 - May 2017