# 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 117 - Introduction to Statistics, instructor — Spring 2024
- Math 234 - Differential Equations, lead instructor — Spring 2024
- 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`.
- Shamel 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 I: Reeb Dynamics and Viterbo Functoriality*
  SBU Student Symplectic Seminar Fall 2022
- *Symplectic Cohomology II: Product Structures, Loop Spaces, and Hochschild Homology*
  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
- Volunteer for Calvin Coding Club for Middle School Students — Fall 2013

## HONORS AND AWARDS

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