

# SHAMUEL AUYEUNG

Trinity College  
Department of Mathematics

## CONTACT INFORMATION

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## EDUCATION

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

## TEACHING

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### Trinity College:

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| • 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:

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| • 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)

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| • <i>Complex Numbers, a Counting Problem, and Messy Data</i> | Summer 2022         |
| • <i>Graph Theory and Error-Correcting Codes</i>             | Spring, Summer 2022 |
| • <i>What is Hamiltonian Mechanics?</i>                      | Spring 2022         |
| • <i>Introduction to Group Theory and its Uses</i>           | Summer 2021         |

- *The Pigeonhole Principle* Summer 2019
- *Complex Numbers and Visualizing Complex Functions* Summers 2018, 2019, 2021

## RESEARCH

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**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

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- 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 Magnetism Lab Intern Summer 2012
- CSU Extreme Ultraviolet Laser Lab Intern Summer 2011

## SERVICE AND OUTREACH

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- 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

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