

SHAMUEL AUYEUNG

Department of Mathematics
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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, Classical Greek, Calvin College	September 2012-May 2017
Thesis advisor: Lee Hardy	

TEACHING

Trinity College:

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| • Math 117 - Introduction to Statistics, instructor | Spring 2025 |
| • Math 234 - Differential Equations, instructor | Spring 2025 |
| • Math 131 - Calculus I, instructor (two sections) | Fall 2024 |
| • Math 117 - Introduction to Statistics, instructor | Spring 2024 |
| • Math 234 - Differential Equations, lead instructor | Spring 2024 |
| • Math 231 - Multivariable and Vector Calculus, lead instructor (two sections) | 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)

- *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 Visualizing 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:

- Samuel Auyeung, Yash Deshmukh, Shuhao Li, *Quantum Brane Topology*, in preparation
- Samuel Auyeung, Thomas Pensyl, Jason Shuster, *On Flowers and Fibonacci-Type Sequences*, available upon request.
- Samuel Auyeung, *Adjacent Singularities, TQFTs, and Zariski's Multiplicity Conjecture*. submitted (2023). <https://arxiv.org/abs/2308.13925>
- Samuel 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>.
- Samuel 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>.
- Samuel 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>.

Conferences:

- Birational Geometry and Quantum Invariants
Simons Center for Geometry and Physics Fall 2023
- Inaugural Simons Math Summer Workshop
Simons Center for Geometry and Physics Summer 2023
- Scissors Congruence, Algebraic K-Theory, and Trace Methods
University of Indiana-Bloomington Summer 2023
- Simons Collaboration: Homological Mirror Symmetry
Simons Center for Geometry and Physics Spring 2023
- Interactions between Symplectic and Holomorphic Convexity in 4 Dimensions
Banff International Research Station Spring 2023
- Hyperkähler Quotients, Singularities, and Quivers
Simons Center for Geometry and Physics Spring 2023
- Four Decades of the Einstein Chair
CUNY Graduate Center Spring 2023

- Birational Complexity of Algebraic Varieties
Simons Center for Geometry and Physics Fall 2022
- Floer Homotopical Methods in Low Dimensional and Symplectic Topology
Simons-Laufer Mathematical Sciences Institute Fall 2022
- Generalized Global Symmetries, Quantum Field Theory, and Geometry
Simons Center for Geometry and Physics Fall 2022
- SYNC Early Career Workshop
University of California-Davis Summer 2022
- Séminaire de Mathématiques Supérieures 2022: Floer Homotopy Theory
University of British Columbia Summer 2022
- Recent Developments in Lagrangian Floer Theory
Simons Center for Geometry and Physics Spring 2022
- Floer Homology in Low-Dimensional Topology (virtual workshop)
Simons Center for Geometry and Physics Spring 2021

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

SERVICE AND OUTREACH

- SBU Math Day - Session on Hexaflexagons October 2022
- 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