

Andrew B. Maurer
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Education

- **University of Georgia** Athens, Georgia
Mathematics, Ph.D. Candidate. 2014 – Present
 - Advisor: Daniel K. Nakano
 - Research Area: Cohomology of Lie superalgebras.
- **University of Massachusetts** Amherst, Massachusetts
Mathematics, BS. Computer Science, Minor. 2010 – 2014
 - Advisor: Farshid Hajir
 - Senior Project: Hasse-Witt invariants of Jacobi polynomials.

Research

- **Representations, cohomology, and geometry of Lie superalgebras.**

I am studying the relative cohomology ring $H^\bullet(\mathfrak{g}, \mathfrak{l}; \mathbb{C})$ of a Lie superalgebra $\mathfrak{g} = \mathfrak{g}_0 \oplus \mathfrak{g}_1$ relative to a reductive subalgebra $\mathfrak{l} \subseteq \mathfrak{g}_0$. My conjecture is that $H^\bullet(\mathfrak{g}, \mathfrak{l}; \mathbb{C})$ is finitely generated over $H^\bullet(\mathfrak{g}, \mathfrak{g}_0; \mathbb{C})$ and that there is a very nice spectral sequence abutting to this relative cohomology. Once this is established I will be able to use algebro-geometric techniques to investigate the mapping of support varieties induced by $H^\bullet(\mathfrak{g}, \mathfrak{g}_0; \mathbb{C}) \rightarrow H^\bullet(\mathfrak{g}, \mathfrak{l}; \mathbb{C})$.

This research builds on work by Benson, Boe, Carlson, Friedlander, Gruson, Hochschild, Kujawa, Nakano, Parshall, and Serre.

- **Tropical geometry, algebra, and Grassmannians**

The Grassmannian $\text{Gr}(d, n)$ is often identified with the image of the Plücker embedding. This variety is isomorphic to the GIT quotient of $M_{d \times n}$ by the (left) action of GL_d . There has been much interest in defining tropical analogues of the Grassmannian, with several constructions due to Speyer and Sturmfels. With N. Giansiracusa, I have been working on an analogue that mimics the GIT construction. We have discovered many interesting similarities and many interesting differences when compared to the classical theory.

This research builds on work by Fink, G. Giansiracusa, N. Giansiracusa, Rincón, Speyer, and Sturmfels.

External Talks & Presentations

- **On the finite generation of cohomology for Lie superalgebras** Fall 2017
AMS Sectional, Categorical methods in representation theory special session
- **Cohomology, Support Varieties, and Lie Superalgebras** Spring 2016
University of Colorado Boulder, Student Algebra Seminar

Internal Talks & Presentations

- **On the finite generation of cohomology for Lie superalgebras** Fall 2017
UGA Algebra Seminar
- **Representation theory I & II** Fall 2017
UGA SMARTS
- **Representation theory via algebraic geometry** Summer 2017
UGA Mock AMS Conference
- **Tropical linear spaces** Fall 2015
UGA Tropical Geometry VRG
- **The tropical Grassmannian** Fall 2015
UGA Tropical Geometry VRG
- **Asymptotically good families** Spring 2015
UGA Graduate Student Seminar
- **Determinantal complexity of the permanent** Spring 2015
UGA Student Algebraic Geometry Seminar
- **Construction of Grassmannian for Schubert calculus** Fall 2014
UGA Schubert Calculus on Grassmannian VRG
- **Computability with an eye towards elliptic curves** Fall 2014
Elliptic Curves Discussion Section

Service

- **Organizer** 2017 – 2018
SMARTS Seminar
- **UGA MathCamp** Summer 2016
UGA Department of Mathematics
- **Algebra Qualifying Exam Preparation Assistant** Summer 2016
UGA Department of Mathematics
- **Graduate Visitation Day Organizer** Spring 2016
UGA Department of Mathematics
- **President** 2016 – 2017
Secretary 2015
UGA Chapter of the American Mathematical Society
- **Logistic Assistance**
Student Algebraic Geometry Seminar 2014 – 2015
Summer Workshop in Algebraic Geometry 2016
Topological Aspects of Algebra and Arithmetic Geometry 2016

Conferences, Summer Schools, and Workshops Attended

- **Topological & Geometric Aspects of the Representation Theory of Finite Groups (Summer School & Workshop)** Summer 2016
Pacific Institute for the Mathematical Sciences
- **Character Theory and the McKay Conjecture Summer School** Summer 2016
Mathematical Sciences Research Institute
- **Southeastern Lie Theory Workshop** Summer 2016
University of Virginia
- **Hodge Theory in Combinatorics Mini-Conference** Spring 2016
Georgia Institute of Technology
- **Georgia Algebraic Geometry Symposium** Fall 2015
Georgia Intstitute of Technology
- **Discrete Mathematics and Algorithms** Fall 2015
Clemson University Mini-Conference
- **Georgia Algebraic Geometry Symposium** Fall 2014
University of Georgia
- **Algebraic Geometry Northeastern Series** Fall 2014
University of Pennsylvania

Teaching History

- **Math 1060:** Mathematics of decision making
Instructor of record Summer 2017
University of Georgia
- **Math 1113:** Precalculus
Instructor of record Fall 2016
University of Georgia
- **High School MathCamp:** Graph Theory Group
Lecturer Summer 2016
University of Georgia
- **Upward Bound:** SAT / ACT Math
Teacher Summer 2014
Upward Bound Summer Program
- **Math 300:** Introduction to Proofs
Teaching Assistant Fall 2013 – Spring 2014
University of Massachusetts
- **Math 127 & 128:** Calculus I & II
Teaching Assistant Fall 2011 – Spring 2013
University of Massachusetts
- **Math 235:** Linear Algebra
Supplemental Instruction Leader Fall 2011 – Spring 2012
University of Massachusetts

Computer Skills

- **General Programming:** Java and Python.
- **Mathematical Programming:** Sage, Pari/GP, Magma, R, and Julia, SciPy stack.
- **Scripting Languages:** Perl, bash.
- **Markup:** \LaTeX , org-mode, and HTML.
- **Operating Systems:** Linux, Windows, Mac OS.