Department of Mathematics
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Education

- **University of Virginia**, Charlottesville, Virginia.

  M.S., May 2008. Subject area: Mathematics.
  Anticipated Ph.D. completion date: May 2009. Advisor: Dr. Brian Parshall.
  Thesis title: *Cohomology of Frobenius–Lusztig kernels of quantized enveloping algbras.*

- **McDaniel College** (formerly Western Maryland College), Westminster, Maryland.

  B.A., May 2004. Majors: Mathematics and Physics.
  Graduated *College Scholar* and *Summa Cum Laude* with Honors in Mathematics and Physics.

Research Interests

Representation theory and cohomology of finite groups, algebraic groups, Lie algebras, quantized enveloping algebras, Hopf algebras, and other related mathematical objects. I am especially interested in the connections between these different mathematical objects, and in ways that the structure of one informs the structure of another.

Publications

- Ph.D. thesis (in preparation): *Cohomology of Frobenius–Lusztig kernels of quantized enveloping algebras.*

Grants and Fellowships Awarded

- **AMS Graduate Student Travel Grant**.
  Awarded partial support to attend the 2009 Joint Mathematics Meetings.

- **Husky Travel Fellowship**, University of Virginia, Fall 2008.
  Awarded funds to travel to the 2008 Fall Central Section meeting of the AMS.

- **Mathematics Department Research Fellowship**, University of Virginia, Fall 2008.
  Relieved of teaching duties for one semester to concentrate on completion of dissertation.

- **East Asia and Pacific Summer Institutes, NSF Grant OISE–0813052**, Summer 2008.
  Awarded travel support and stipend to work with Professor Jie Du at the University of New South Wales in Sydney, Australia. Additional support provided by the Australian Academy of Science.

- **Mathematical Sciences Research Institute (MSRI) travel support**, Spring 2008.
  Received partial support from MSRI to attend May 2008 workshop on homological methods in representation theory.

- **Edwin E. Floyd Fellowship**, University of Virginia, Fall 2004.
  Awarded fellowship to support studies during first year of graduate coursework.

Conferences and Workshops Attended

- 2009 Joint Mathematics Meetings. Washington, D.C. (Registered.) Invited to deliver a talk in the Special Session on Representation Theory of Lie Algebras and Algebraic Groups.
- 2008 Fall Central Section meeting of the AMS. Western Michigan University, Kalamazoo, MI. Delivered an invited talk in the Special Session on Computation in Modular Representation Theory and Cohomology.
- Mathematical Sciences Research Institute (MSRI) program on representation theory of finite groups and related topics. Berkeley, CA; March 31–April 4, 2008. Attended the week-long workshop on homological methods in representation theory.
- American Institute of Mathematics (AIM) workshop on cohomology and representation theory for finite groups of Lie type. Palo Alto, CA; June 25–29, 2007. Worked with experts in the fields of finite group theory, representation theory, and computational algebra to formulate and classify potential research problems in terms of their amenability to solution through computer calculations. Learned how to use the computer algebra systems GAP, MAGMA, LiE, and Chevie to perform calculations with Lie algebras and quantum groups, with an emphasis on attacking outstanding research problems.

Invited Talks

- *Cohomology of finite-dimensional quantized enveloping algebras, the mixed case.* (Scheduled.)
  Special Session on Representation Theory of Lie Algebras and Algebraic Groups.
  2009 Joint Mathematics Meetings, Washington, D.C.; January 5, 2009.
- *Adjoint actions on integral forms in quantized enveloping algebras.*
  Special Session on Computation in Modular Representation Theory and Cohomology,
  2008 Fall Central Section AMS meeting, Kalamazoo, MI; October 18, 2008.
- *Calculus, and other things I didn't learn until graduate schoool.*
  Undergraduate seminar, McDaniel College; September 30, 2008.

Other Talks

- *Fun with Hopf algebras.*
  Graduate Seminar, University of Virginia; September 5, 2008.
- *Cohomology of infinitesimal algebraic groups and quantized enveloping algebras.*
  Pure Mathematics Departmental Seminar, University of New South Wales; August 5, 2008.
- *The Steinberg module and Steinberg's tensor product theorem.*
  Algebra Seminar, University of Virginia, September 2007.
- *Dynkin diagram automorphisms and realizations of twisted affine Lie algebras.*
  Algebra Seminar, University of Virginia, November 2006.
- *Division algebra theorems of Frobenius and Wedderburn.*
  Algebra Seminar, University of Virginia, November 2005.

Additional Research Experience

- **East Asia and Pacific Summer Institutes, NSF Grant OISE–0813052**, Summer 2008.

  This program, a joint venture between the NSF and its counterpart agencies in the seven participating countries, provides U.S. graduate students in science and engineering with first-hand research experience in East Asia and the Pacific region. In 2008, I was one of 20 graduate students to be awarded a travel grant to Australia as part of this program. During my two month residence in Sydney, I worked with Professor Jie Du at the University of New South Wales and with Visiting Professor Bangming Deng of Beijing Normal University, studying cluster algebras, quantum enveloping algebras, and q-Schur algebras.

- **Summer Undergraduate Research Fellowship (SURF)**, National Institute for Standards and Technology (NIST), Summer 2002.

  Measured the response rates of thermoluminescent radiation dosimeters under the guidance of Dr. Christopher Soares. Determined the effectiveness of commercially available radiation dosimeters for use in calibrating medical x-ray equipment.

- **Student researcher**, McDaniel College, 2001–2004.

  Conducted thermoluminescence research with Physics professor Dr. Vasilis Pagonis. Developed a Mathematica-based computer model for thermoluminescent properties of annealed quartz, as part of a senior Honors project.

Teaching Interests

Abstract algebra, linear algebra, number theory, mathematical analysis.

Teaching Experience

- **Instructor, Calculus I and II**, Fall 2006–Spring 2008.

  Taught one section of first semester calculus, and three semesters of second semester calculus. These upper-level calculus courses are targeted at students majoring in mathematics and the natural sciences. Typical classes consisted of 25–35 students. Responsible for lecturing all course material, assigning and grading homework, assisting in the preparation of midterm and final exams, grading exams, and assigning final letter grades. In Fall 2006 and Spring 2007, was also responsible for conducting the weekly fourth-hour problem session.

- **Instructor, Applied Calculus I and II**, Fall 2005–Spring 2006, Spring 2009.

  Taught one semester each of first and second semester calculus. (Scheduled to teach second semester calculus in Spring 2009.) These lower-level calculus courses are targeted at students majoring in business, the humanities and the social sciences. Typical classes consisted of 35–45 students. Responsible for lecturing all course material, assigning and grading homework, assisting in the preparation of midterm and final exams, grading exams and assigning final letter grades.

- **Teaching Assistant, Differential Equations**, Spring 2005.

  This introductory course was taught in the Engineering school to approximately 50 undergraduate Engineering majors. Responsible for conducting the weekly fourth-hour problem session, assigning and grading weekly quizzes, and assisting in the grading of exams.

- **Teaching Assistant, Multivariable Calculus**, Fall 2004.

  This Honors level course was taught to approximately 15 mathematics majors. Responsible for conducting the weekly fourth-hour problem session, assigning and grading weekly quizzes, and grading occasional projects or other homework as needed.

- **Grader**, Fall 2007–Fall 2008.

  Served as the grader for undergraduate sections of Number Theory, Computational Algebra (an introductory abstract algebra course with an emphasis on Groebner bases and computational algorithms), Introduction to Modern Algebra, and Advanced Linear Algebra.

Service and Professional Activities

- University of Virginia Library Student Advisory Committee, Fall 2005–Present.
- Assistant to WeBWorK System Administrator. Gained experience working with the WeBWorK online homework evaluation system under the guidance of Dr. Jeff Holt at the University of Virginia. Primarily focused on problem library upkeep. Fall 2006–Fall 2007.
- Memberships: American Mathematical Society.

Honors Received

- Phi Beta Kappa, inducted Spring 2004.
- Dr. Clyde A. Spicer Award (outstanding senior in Mathematics), McDaniel College.
- Harry C. Jones Physics Scholarship, McDaniel College, Spring 2003.
- Barry M. Goldwater Memorial Scholarship, Spring 2002.
- H. Samuel Case and Susan Snodgrass Case Award for Excellence in Scholarly Research, McDaniel College, Spring 2002.
- David Brian Cross Award for Achievement in Mathematics, McDaniel College, Spring 2002.
- Kappa Mu Epsilon, National Mathematics Honor Society, inducted Spring 2002.
- Lowell R. Duren Mathematics Award, McDaniel College, Fall 2001.
- Sigma Pi Sigma, National Physics Honor Society, inducted Fall 2001.
- Eagle Scout, earned February 2000.