

Curriculum Vitae

Jason R. Elsinger

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Education

- North Carolina State University** Raleigh, NC
Mathematics, Ph.D. July 2014
Advisor: Dr. Bojko Bokolav
Dissertation Title: *Classification of Orbifold Modules under an Automorphism of Order Two*
- North Carolina State University** Raleigh, NC
Mathematics, M.S. December 2011
Qualifying Exams: Abstract Algebra, Linear and Lie Algebras, Topology
- Bloomsburg University of Pennsylvania** Bloomsburg, PA
Mathematics, B.S. May 2009
Physics, B.S. May 2009
Magna Cum Laude

Research Interests

Mathematics: Representation Theory, Mathematical Physics, Lie Algebras, Lattice Vertex Algebras

Education: Active Learning & IBL, Mastery-based Assessment, Interactive Lecture, Cooperative Learning

Teaching Experience

Assistant Professor - Department of Mathematics, Florida Southern College Fall 2017 – Present

Responsibilities:

Prepare and present all lectures, write syllabi, write and grade all exams, quizzes, and homework,
hold office hours, determine students' final grades, maintain active research

Assistant Professor - Department of Mathematics, Spring Hill College Fall 2014 – Spring 2017

Courses Taught:

- MTH 321: Differential Equations (Spring 2017)
- MTH 451: Real Analysis (Fall 2016)
- MTH 464: Complex Variables (Spring 2016)
- MTH 163: Basic Statistics (Fall 2015, Spring 2016, Fall 2016, Spring 2017)
- MTH 122: Calculus II (Fall 2015)
- MTH 321: Linear Algebra (Spring 2015)
- MTH 465: Probability Theory (Fall 2015)
- MTH 111: Precalculus (Fall 2014, Spring 2016)
- MTH 121: Calculus I (Fall 2014, Spring 2015)
- MTH 140: Business Calculus (Fall 2014, Spring 2017)

Course Instructor - Department of Mathematics, North Carolina State University Fall 2010 – Spring 2014

Responsibilities:

Prepare and present all lectures, write syllabi, write all exams and quizzes,
guide appointed student graders, hold office hours, determine students' final grades

Courses Taught:

- MA 241: Calculus II for Scientists and Engineers (Spring 2014)
- MA 407: Modern Algebra for Mathematics Majors (Fall 2013)
- MA 141: Calculus I for Scientists and Engineers (Fall 2012)
- MA 231: Calculus II for the Life Sciences (Spring 2012)

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- MA 131: Calculus I for the Life Sciences (Fall 2011, Spring 2011)
- MA 107: Precalculus I (Fall 2010)

Lecture Assistant - Department of Mathematics, North Carolina State University

Fall 2009 – Spring 2010

Responsibilities:

Grade exams, hold office hours, attend lectures, prepare recitations

Courses:

- MA 242: Calculus III for Scientists and Engineers (Spring 2010)
- MA 341: Differential Equations (Fall 2009)

Trained Peer Tutor - Bloomsburg University

Fall 2005 – Spring 2009

- Bloomsburg University Tutorial Services (Tutor students individually)
- Bloomsburg University Physics Department (Walk-in tutoring hours)

Professional Development in Teaching

Faculty Learning Community - Spring Hill College

Spring 2016 – Spring 2017

- Faculty funded to discuss active learning strategies (\$500 Stipend)

Peer Teaching Mentor Program - Spring Hill College

Spring 2015 – Spring 2017

- Each member films themselves teaching and shows a sample to a group of peer faculty from different departments
- The group meets annually to view the samples and discuss teaching methods and avenues for improvement

Preparing the Professoriate Fellow - North Carolina State University

Fall 2012 – Fall 2013

- Highly selective 1-year program designed to provide a mentoring relationship between doctoral students and a distinguished faculty member focused on teaching an upper-level mathematics course at North Carolina State University
- Attend teaching seminars directed toward future faculty (see portfolio)
- Observe the faculty mentor teach the course for one semester
- After observation, teach the same course (*Modern Algebra for Mathematics Majors*)

Mathematics Teaching Assistant Workshop - North Carolina State University

August 2009, May 2010

- Series of discussion sessions and presentations during the first year as a graduate teaching assistant at North Carolina State University
- Present an undergraduate lesson before a panel of faculty members
- Meet again the following year to discuss experiences

Research Experience

Spring Hill College

Fall 2015 – Present

- Currently collaborating with B. Bakalov, V. Kac, and I. Todorov on a project investigating modular transformations of irreducible characters of orbifold lattice vertex algebras

North Carolina State University

Fall 2011 – Spring 2014

- Doctoral thesis research conducted with Dr. Bojko Bakalov. Constructed and classified completely the irreducible modules of orbifold lattice vertex algebras corresponding to an isometry of order two. Orbifolds play an important role in string theory and conformal field theory

NSF Funded Research Experience for Graduates

- Linear algebraic monoids, North Carolina State University, Dr. Mohan Putcha Summer 2011
- Semigroups, North Carolina State University, Dr. Ernie Stitzinger Summer 2010

Published Papers and Preprints

- “Orbifolds of Lattice Vertex Algebras and their Twisted Modules” (with B. Bakalov, V. Kac, I. Todorov)

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- In preparation
- “Quantum Dimensions and Fusion Products for Irreducible V_Q^{σ} -modules with $\sigma^2=1$ ”
Comm. In Alg, Volume 45, Issue 7, 2017, pp. 3091-3109.
- “Orbifolds of Lattice Vertex Algebras Under an Isometry of Order Two” (with B. Bakalov)
J. Algebra, Volume 441, 2015, pp. 57-83.
- "An Elementary Proof of the Simpson's Rule Error Formula."
Pi Mu Epsilon, Volume 12, 2007, pp. 353-357.

Refereed Articles

- "Intertwining operators among twisted modules" Summer 2017
Journal of Algebra
- "2-permutations of lattice vertex operator algebras: higher rank" Summer 2016
Journal of Algebra
- "Characterizations of the vertex operator algebras V_L^T and V_L^O " Summer 2015

Mentoring Experience

Spring Hill College (capstone projects)

- Seth Polanski: Group theory applied to chemistry Spring 2017
- Joseph Crapanzano: Microeconomic theory Spring 2017
- Anthony Weaver: Representations of finite groups Spring 2016
- Grady Blanks: Game theory and Zermilo's theorem Spring 2015
- Austin Puntilla: Symmetry group of the Rubik's cube Spring 2015

NSF Research Experience for Graduates Mentor

- Teach preliminary material and meet with students weekly Summer 2013
- Representation theory, vertex operators, W-algebras

Work Experience

Contractor for *WebAssign* - Mathematics Content Contributor June 2011 – January 2014

- Author questions, feedback, solutions, and tutorials for calculus problems
 - Work with others to accomplish goals and deadlines
- Project Manager: Jennifer Ferralli

Outreach Service

Girls Exploring Math and Science (GEMS) – *Spring Hill College* November 5, 2016

- Organization to foster young women's interests in STEM through middle and high school
- Half-day program including hands-on workshops to experience STEM careers
- Led a morning session with 20 – 30 students
- Students learned to encode and decode single-shift and code-word ciphers

Co-director for Science Olympiad – *Spring Hill College* Fall 2016 – Spring 2017

- Coordinated with the state director
- Led the Science Olympiad Planning Committee
- Built the day-of schedule for all events and reserved all rooms
- Coordinated with administration in hosting the event

Vigor & Blount Middle School Math Games – *Spring Hill College* November 2014, 2015

- Middle school students visited the mathematics building as part of a campus tour
- Led afternoon sessions with 15 – 20 students
- Students learned to encode and decode single-shift and code-word ciphers

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Session Leader for Math Circle in the Triangle – *North Carolina State University* March 22, 2014

- Mathematics enrichment program for enthusiastic middle school students which provides students opportunity to explore topics in mathematics that lie outside regular school curriculum
- Led a morning session with 20 students
- Students played paper and pencil games, using logic to construct strategies

Exploring Emergence – *Bloomsburg University* Summer 2007, 2008

- Summer camp devoted to stimulating excitement in students in grades 8 - 10 to the ideas of mathematical problem solving and computer programming
- Taught 90-minute lessons about using interactive computer modeling as part of the computer science portion of the day

Committee Service

Upward Bound Steering Committee – *Spring Hill College* Fall 2015 – Present

- Composed of both faculty and staff
- Program that serves high school students from low-income families
- Students in the program take classes and attend a summer residential program to prepare them for the college environment
- Led efforts in returning the Upward Bound program to Spring Hill College

Faculty Development and Compensation – *Spring Hill College* Fall 2015 – Present

- Served as representative of the Science Division
- Proposed solutions to inverted and compressed salaries
- Read faculty grant proposals and allocated grant funds
- Started “Faculty Friday”, where faculty present general research talks

Science Olympiad Planning Committee – *Spring Hill College* Fall 2014 – Spring 2017

- Found event supervisor volunteers
- Served as an event supervisor

Faculty Manual Revision (Ad-Hoc Subcommittee) – *Spring Hill College* Fall 2015 – Fall 2016

- Reviewed, revised, and reorganized the entire faculty manual
- Developed agreed upon definitions and terminology
- Resolved many discrepancies in the language
- Developed a criteria for excellence with methods of documentation

Academic Awards and Honors

North Carolina State University
- Thank-a-Teacher Recipient Spring 2012

Bloomsburg University
- C.R. Reardin Memorial Award for Outstanding Student of Mathematics
- Levi Grey Memorial Scholarship for Outstanding Achievement in Physics
- S.M.A.R.T. Grant
- Kozloff Scholarship received for Independent Study in Abstract Algebra

Talks Given

Southern Regional Algebra Conference (Mobile, AL)

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<i>Representations of lattice vertex algebras, trace functions, and modular transformations</i>	March 18, 2017
AMS Session on Lie Groups, Discretization, and Gelfand Pairs (Atlanta, GA) <i>Quantum Dimensions and Fusion Products for Irreducible Modules of Orbifold Lattice Vertex Algebras under an Isometry of Order Two: A step toward the general case</i>	January 6, 2017
MAA Session on Assessment (Atlanta, GA) <i>Using Mastery Based Assessment in a Precalculus Course</i>	January 6, 2017
MAA Sectional Meeting: Algebraic Structures in Mathematical Physics (Athens, GA) <i>Orbifold Modules under an Automorphism of Order Two: Irreducible Modules and Quantum Dimensions</i>	March 5, 2016
Southeast Lie Theory Workshop (Raleigh, NC) <i>Orbifold Modules under an Automorphism of Order Two: Quantum Dimensions and Fusion Products</i>	October 14, 2015
Joint Mathematics Meetings (Baltimore, MD) <i>Classification of Orbifold Modules under an Isometry of Order Two</i>	January 15, 2014
Algebra and Combinatorics Seminar at NCSU (Raleigh, NC) <i>Classification of Orbifold Modules under an Isometry of Order Two</i>	October 28, 2013

Selected Conferences Attended

- Conference in Teaching and Learning (CoTL) <i>Mobile, AL</i>	May, 2017
- Southeast MAA Section Meeting <i>Athens, GA</i>	March, 2016
- Symmetries in Mathematics and Physics II <i>Rio de Janeiro, Brazil</i>	June, 2013
- Southeast Lie Theory Workshop <i>Raleigh, NC</i>	October, 2015
- Joint Mathematics Meetings <i>Charleston, SC</i>	October, 2012
- Joint Mathematics Meetings <i>Raleigh, NC</i>	April, 2012
- Joint Mathematics Meetings <i>Atlanta, GA</i>	January, 2017
- Joint Mathematics Meetings <i>Baltimore, MD</i>	January, 2014
- Joint Mathematics Meetings <i>Boston, MA</i>	January, 2012
- Joint Mathematics Meetings <i>New Orleans, LA</i>	January, 2011

Technology

WebAssign, Blackboard, Moodle, Mathematica, LaTeX

Affiliations

Memberships

- American Mathematical Society

Honor Societies

- International Honor Society of Phi Kappa Phi

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- Physics Honor Society of Sigma Pi Sigma
- Mathematics Honor Society of Kappa Mu Epsilon