

Julie Catherine Beier

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RESEARCH INTERESTS

Lie algebras, Representation Theory, Combinatorics, Education

EDUCATION

North Carolina State University, Raleigh, NC 27659

Ph. D., Mathematics, May 2008

Dissertation advisor: K. C. Misra

Title: Crystals for Demazure Modules of Special Linear Quantum Affine Algebras

Interdisciplinary Minor: Mathematics education and statistics

M.S., Mathematics, December 2005

Barton College, Wilson, NC 27893

B.S., Mathematics with Secondary-Level Teaching Licensure, May 2003

B.S., Education of the Deaf and Hard of Hearing, May 2003

Summa Cum Laude, Valedictorian

PUBLICATIONS

- M. L. Bellamy, J. Simpson, J. Beier, S. Li, D. Haase, & S. Schulze, Eds.: *Environmental Science: A Collection of Activities for the High School Classroom – Volume II*. Book published by the NSF Science and Technology Center for Environmentally Responsible Solvents and Processes.
- S. Bektesevic, J. Beier, L. Chen, N. Eghbali, S. King, G. Mehta, R. Mullins, J. Reiner, R. Weikel, S. Xie, & E. Gunn: "Green Challenges: Student Perspectives from the 2004 ACS-PRF Summer School on Green Chemistry," *Green Chemistry*, 2005, (6), pp. 403 - 407

EMPLOYMENT & TEACHING

Mercer University

Macon, GA

August 2008 – Current

Assistant Professor

- MAT 260 – Introduction to Abstract Mathematics
- MAT 191 – Calculus 1
- MAT 126 – Elementary Statistical Methods
- UNV 101 – University 101

North Carolina State University

Raleigh, NC

June 2006 – June 2008

Graduate teaching assistant teaching own courses

- MA 407 – Abstract Algebra for Mathematics Majors
- Preparing the Professoriate – Program for professional development (2007-2008)
- MA 141 – Calculus I (For Engineering and Science Majors)
- MA 107 – Precalculus I

- MA 103 – Topics in Contemporary Mathematics
- Completed TA Training Workshop (Fall 2006)

The Science House **Raleigh, NC** **September 2003 – May 2006**
 Graduate assistant working on NSF's CERSP education component including curriculum development, student workshops, and leading professional development for educators including:

- Educator Workshops in Environmental Science – Workshop Instructor
- Student Workshops and presentations – Instructor / Presenter

Tutor.com **September 2006 – June 2007**
 Provide online tutoring in mathematics for students at the K-12 and beginning college levels

Shodor Education Foundation Inc., **Durham, NC** **September 2000 - May 2003**
 Member of Succeed-HI team (working on a NSF grant) completing modules for the instruction of Deaf students. Additionally:

- Instructor for student camps on mathematics and science

Student Teacher, Barton College **Wilson, NC** **January 2003 – May 2003**

- Mathematics: Algebra I, Algebra III, Honors Trig
- Deaf Education: Introduction to Computers, Civics
- Itinerate: Language Development PreK - 8th

P R E S E N T A T I O N S

- **West Central Georgia, Regional STEM Institute** **December 4-5, 2009**
 - Invited Panalist and Speaker: *Creating a Learning Community**
 *"Learning Community" is used in a non-traditional sense here
- **International Workshop on Quantized Algebras and Physics, Chern Institute of Mathematics, Nankai University, Tianjin, China** **July 23-26, 2009**
 - Invited Speaker: *Demazure Crystals of $Uq(sl\sim(n))$*
- **Algebra Seminar, Emory University** **March 24, 2009**
 - Invited Speaker: *Representation Theory: A Brief Introduction from the $sl(n)$ Perspective*
- **Joint Mathematics Meeting, Washington DC** **January 2009**
 - Invited Speaker (Special Session: Representation Theory of Lie Algebras and Algebraic Groups): *Combinatorics of Crystal Bases for Certain Demazure Modules*
- **Connections for Women: Intro. to the Spring 2008 Programs, MSRI** **January 16, 2008**
 - Poster Presentation: *Combinatorics of Crystal Bases for Some Simple Quantum Affine Algebra Modules*
- **Joint Mathematics Meeting, San Diego, CA** **January 8, 2008**
 - Presenter: *Combinatorics of Crystal Bases for Certain Demazure Modules*
- **NCSU Algebra Graduate Student Seminar** **October 8, 2007**
 - Presenter: *Combinatorics of Crystal Bases for Certain Demazure Modules*
- **Mid-Atlantic Algebra Conference (at NCCU)** **April 21-22, 2007**
 - Presenter: *Demazure Crystals for $Uq(sl\sim(n))$ Modules*
- **NCSU Graduate Research Symposium** **March 2007**
 - Poster Presentation: *Combinatorics of Crystal Bases for Some Simple Quantum Affine Algebra Modules*
- **NCSU Graduate Recruitment** **February 2007**
 - Presenter: *Extend Young Diagrams (For $Uq(sl\sim(2))$ Crystals)*
- **ACS-PRF Green Chemistry Conference, Pittsburgh PA** **Summer 2004**
 - Poster Presentation: *National Science Foundation's CERSP K-12 Outreach*

WORKSHOPS ATTENDED

- **Project NExT at the Joint Mathematics Meetings** **January 10-16, 2010**
“Great Books and Mathematics” MAA Minicourse
- **Project NExT at MathFest** **August 2 – 9, 2009**
- **Peking University** **July 18 – 22, 2009**
“International Workshop on Algebraic Groups, Quantum Groups and Related Topics”
- **Fields Institute** **June 15 – July 3, 2009**
“Summer School and Conference in Geometric Representation Theory and Extended Affine Lie Algebras” at University of Ottawa
- **Banff International Research Station** **March 2 – 7, 2008**
“Quantum affine Lie algebras, extended affine Lie algebras, and applications” Workshop
- **Fields Institute** **March 24 – 26, 2006**
“Lie Algebra” Workshop at University of Ottawa

GRANTS AND AWARDS

- **NSF Twenty-ninth Southeastern-Atlantic Conference on Differential Equations DMS-0951042**
(PI Keith Howard) 2009
- **Project NExT 2009 – 2010 Fellow**
- **NSF/MAA Research by Undergraduates in Mathematics Conference Grant DMS-0536991**
(Program Director Keith Howard) 2009
- **AWM/NSF Travel Grant** 2008-09

MEMBERSHIPS

- American Mathematical Society
- Association for Women in Mathematics
- Council on Undergraduate Research
- Mathematical Association of America
- Sigma Xi

SYNERGY ACTIVITIES

- **Reviewer for CMJ** **2009 – Present**
- **AWM Essay Contest Committee** **January 2009 – Present**
- **SEARCEDE** **October 2009**
 - Member of organizing committee
- **JFL Steering Committee** **August 2009-Present**
- **MUURMaC** **February 2009**
 - Member of organizing committee
- **Organize Workshops on Computational Science** **January 2009**
 - Workshop speaker is Dr. Panoff from Shodor Education Foundation; Workshops are for students in all fields.
- **Faculty Search Committee Member** **2008 - 2009**
- **Scholarship Weekend Volunteer** **2008, 2009, 2010**
- **Organized Workshops on Computational Science** **October 14 – 16, 2008**
 - Workshops title “Computational Thinking Across the Curriculum: The Power and the Peril”; Speaker was Dr. Panoff from Shodor Education Foundation; Workshops included a general talk, humanities workshop, scientific workshop, and educator workshop
- **High School Math Competition** **November 2008, 2009**
 - Volunteer to help prepare problems, proof test and run event