

Katherine Victoria Johnson

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EDUCATION

Ph.D. Mathematics, expected May 2012

University of Nebraska–Lincoln
Thesis Title: *The Weak Discrepancy and Linear Extension Diameter of Grids and Other Posets*
Thesis Advisor: Jamie Radcliffe

M.S. Mathematics, May 2009

University of Nebraska–Lincoln

B.S. Mathematics with a minor in Computer Science, May 2007

The College of William and Mary
Graduated with High Honors
Honors Thesis Title: *Counting Hessenberg Matrices*
Honors Thesis Advisor: Charles R. Johnson

AWARDS AND FELLOWSHIPS

Mentoring through Critical Transition Points Traineeship, 2011

A department fellowship for students entering their last year of study that develops teaching, research, and mentoring skills, in particular by acting as a TA for the IMMERSE summer program for pre-grads, and provides extra time during the academic year for research.

SIAM Math Matters Contest, 2011

Third place: The math behind...Music Restoration

Othmer Fellowship, 2007-2010

A highly competitive university-wide fellowship that provides additional support of \$8000 per year for three years.

Jack Kent Cooke Foundation Undergraduate and Young Scholar, 2002-2007

I was hand-picked to be in the first group of 50 young scholars nationwide, and then was the first to subsequently receive the undergraduate scholarship of up to \$30,000 per year.

RESEARCH

Research Interests

Extremal and Probabilistic Combinatorics, Partially Ordered Sets, Entropy, Graph Theory

Publications

The Linear Extension Diameter of Grids, preprint available on my website
Weak Discrepancy of Grids and Other Lattices, in preparation
A Note on the Existence of Universal Cycles for Trees, in preparation

Research Programs and Summer Schools

- Memphis-Budapest Summer School in Combinatorics, Alfréd Rényi Institute, Budapest, 7-20 August 2011
- Intensive Mathematics: a Mentoring, Education and Research Summer Experience, University of Nebraska–Lincoln, Summer 2007

- Director's Summer Program, National Security Agency, Summer 2006
During this twelve-week program, I investigated problems related to topics including data mining, computer vision, image processing, and biometrics.
- Research Experience for Undergraduates, Clemson University, Summer 2005
During this eight-week program, I worked under the direction of Professors Neil Calkin and Kevin James. Along with two other students, I did research on the Quadratic Sieve and methods of improving its efficiency.
- Research Academy, Clay Math Institute, March 2003
One of twelve nationally selected high school students.

Invited Talks

- AMS Spring Southeastern Section Meeting Special Session on Combinatorics: Algebraic and Geometric, University of South Florida, *The Linear Extension Diameter of Grids*, 2012
- Joint Mathematics Meetings AMS Session on Combinatorics and Graph Theory, *Weak Discrepancy of Grids*, 2012
- University of Kansas Combinatorics and Algebra Seminar, *The Linear Extension Diameter of Grids*, 2011
- University of Colorado–Denver Discrete Math Seminar, *The Linear Extension Diameter of Grids*, 2011
- National Security Education Consortium Crypto Workshop Lecturer, 2011
Part of a three-person team of math graduate students who gave an introduction to how math applies to National Security as part of a week-long simulation, including a hands-on segment to break a set of encrypted messages
- Guest lecturer for a Linear Algebra class at Creighton University, *Linear Algebra and Graph Theory*, 2011
- All Girls, All Math Lecturer, *Financial Mathematics*, 2010
- Joint Mathematics Meetings AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates and the MAA Undergraduate Poster Session, *Counting Lower Hessenberg Matrices*, 2007
- Nebraska Conference for Undergraduate Women in Mathematics, *Counting Lower Hessenberg Matrices*, 2007
- James Madison University Shenandoah Undergraduate Mathematics and Statistics Conference, *On the Counting of Lower Hessenberg Matrices*, 2005

Seminar Talks at UNL

Discrete Math Seminar:

- *The Technique of "Focusing" in Ramsey Theory*, 2011
- *The Magic of Universal Cycles*, 2011
- *The Linear Algebra Method*, 2011
- *Counting Lower Hessenberg Matrices*, 2009

Graduate Student Seminar:

- *A Few Interesting Answers to Some Hard Questions*, 2010
- *Erdős' Proof of Bertrand's Postulate*, 2009

Conferences

Joint Mathematics Meetings, 2007-2011

- 2010 Minicourse: *Fibonacci and Catalan Numbers*

AMS Sectional Meeting, University of Nebraska–Lincoln, October 2011
 AMS Sectional Meeting, University of Notre Dame, November 2010
 AMS Sectional Meeting, University of Illinois, March 2009
 Nebraska Conference for Undergraduate Women in Mathematics, 2007, 2010, 2011
 James Madison University Shenandoah Undergraduate Math and Statistics Conference, 2005
 Stanfest, Massachusetts Institute of Technology, June 2004

Seminars Regularly Attended

Discrete Math Seminar, 2007-2011
 Graduate Student Seminar, 2008-2011
 Academic Job Search Seminar, 2011
 Professional Development Seminar, 2011
 Teaching Seminar, 2008

TEACHING

Instructor of Record

Course #	Name (number of sections)	Description
Math 101	College Algebra (2)	a calculus preparation course
Math 203	Contemporary Math (5)	develops quantitative reasoning skills
Math 300	Math Matters (1)	a foundational elementary education course
Math 301	Geometry Matters (1)	an elementary education geometry course

As the primary instructor, I was responsible for lecturing and writing and grading exams and quizzes, along with planning class activities. For Contemporary Math and the Elementary Education courses, I was also responsible for creating semester-long projects and shorter writing assignments, writing my own syllabus and choosing what sections would be covered during the semester, and deciding which homework problems to assign.

Teaching Assistant

Summer 2011	Analysis TA for Intensive Mathematics: a Mentoring, Education and Research Summer Experience, duties included running problem sessions under the direction of Professor Daniel Maxin where I helped future graduate students read a paper on Dynamical Systems, and also maintaining the course website
Summer 2010	TA for NebraskaMATH, “Algebra for Algebra Teachers,” This was a course for current high school math teachers to work towards a Master’s degree of Teaching. My responsibilities included grading homework, answering questions during class, running evening homework help sessions, and presenting some material.
2007 - 2008	Recitation Section Leader, Calculus I (4 sections), 50-minute bi-weekly problem sessions, proctored and graded quizzes, created worksheets, handouts, and review sheets.
Summer 2003	TA for The Math and Science Program for Junior High Students at USF
2003 - 2010	Math Resource Center and Math Tutor

Grader

Fall 2010	Graduate level Combinatorics class
Fall 2004	Calculus and Linear Algebra at the College of William and Mary
Spring 2003	Differential Equations at the University of South Florida

SERVICE

Discrete Math Seminar Organizer, Fall and Spring 2011**AMS 2011 Fall Central Section Meeting, University of Nebraska–Lincoln**

Poster Session Committee Member

Nebraska Conference for Undergraduate Women in Mathematics

Registration, 2011

Invited Graduate Student, 2010

Math Department Graduate Student Orientation, Summer 2009 and 2010

Part of a two-person team to organize all of orientation for the incoming graduate students for the department, and run several of the panels

Committee to choose a new Contemporary Math textbook, Spring 2010**Annual Math Day at the University of Nebraska-Lincoln**

Math Bowl Moderator, Math Bowl Timer, Setup, 2007-2011

Invited Panelist

- Creighton University Pi Day, Experiences in Graduate School, 2011
- Nebraska Conference for Undergraduate Women in Mathematics, Choosing a Mathematics Graduate Program, 2010
- Nebraska Conference for Undergraduate Women in Mathematics, Summer Research Opportunities, 2010
- IMMERSE, Succeeding in Graduate School, 2011
- Math Literature Seminar, How to read papers and give good presentations, 2009 and 2010
- Math Education Seminar, Math GTAs' experiences teaching teachers, 2010

PROFESSIONAL SOCIETIES

American Mathematics Society

Association for Women in Mathematics

Society for Industrial and Applied Mathematics

REFERENCES

Jamie RadcliffeUniversity of Nebraska–Lincoln
402-472-4503
aradcliffe1@math.unl.edu**Stephen Hartke**University of Nebraska–Lincoln
402-472-7001
hartke@math.unl.edu**Judy Walker**University of Nebraska–Lincoln
402-472-1628
jwalker7@math.unl.edu**John Orr (teaching)**University of Nebraska–Lincoln/Google
402-613-6581
jorr@math.unl.edu**Marc Warburton**National Security Education Consortium
402-312-1075
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