Sarah Bockting-Conrad   Curriculum Vitae

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Citizenship   USA

Positions Held Post-Ph.D.

Oberlin College, Oberlin, Ohio, USA

Visiting Assistant Professor of Mathematics

Education

University of Wisconsin–Madison, Madison, Wisconsin, USA

Ph.D., Mathematics, May 2014
- Advisor: Professor Paul M. Terwilliger
- Research Interests: Tridiagonal pairs, Lie theory, algebraic combinatorics, quantum groups
- Minor: Analysis

M.A., Mathematics, December 2009

University of Evansville, Evansville, Indiana, USA

B.S., Pre-doctoral Mathematics and Physics, May 2007
- *Summa cum Laude*, with 3.98 GPA

Publications

S. Bockting-Conrad. Tridiagonal pairs of q-Racah type, the double lowering operator ψ, and the quantum algebra $U_q(\mathfrak{sl}_2)$. *Linear Algebra Appl.* **445** (2014) 256-279. `arXiv:1307.7410`.

S. Bockting-Conrad. Two commuting operators associated with a tridiagonal pair. *Linear Algebra Appl.* **437** (2012) 242–270. `arXiv:1110.3434v1`.

S. Bockting-Conrad, P. Terwilliger. The algebra $U_q(\mathfrak{sl}_2)$ in disguise. *Linear Algebra Appl.* **459** (2014) 548-585. `arXiv:1307.7572`.

Honors & Awards

University of Wisconsin–Madison
- Superior TA rating, 11 of 14 semesters
- UW–Madison Exceptional Service Award - Nominee, 2012-2013
- College of Letters & Science Teaching Fellow Award - Alternate, 2012
- Elizabeth Hirschfelder Award, Department of Mathematics, 2010-2011
- Mathematics Graduate Teaching Award, Department of Mathematics, 2010
- Honored Instructors Award, Division of University Housing, Fall 2009 & Spring 2011

University of Evansville
- Bennett-Knott Award, Department of Mathematics, 2007 - Awarded to the outstanding senior in mathematics

Teaching & Related Experience

Department of Mathematics   **July 2014 - Present**
Oberlin College, Oberlin, Ohio, USA

Visiting Assistant Professor
- Calculus 1a (Fall 2014)
- Multivariable Calculus (Fall 2014)

Department of Mathematics   **Fall 2007 - Spring 2014**
University of Wisconsin–Madison, Madison, Wisconsin, USA

Instructor

- College Algebra (Spring 2012, Fall 2012, Spring 2013, Fall 2013, Spring 2014)
- Intermediate Algebra (Spring 2011, Fall 2011)

Teaching Assistant

- Calculus and Analytic Geometry I (Fall 2009, Fall 2010)
- Calculus and Analytic Geometry II (Fall 2007, Fall 2008, Summer 2010)
- Calculus with Algebra and Trigonometry II (Spring 2008, Spring 2010)
- Linear Algebra and Differential Equations (Spring 2009)

Course Redesign Committee Member

Throughout the Spring 2012 semester, I worked closely with two academic staff members to redesign the pre-calculus sequence. Our goal was to create a blended classroom environment in which students were actively engaged in their own learning. To this end we adapted the instructor-as-coach model and integrated technology into the classroom so that we could provide students with frequent and immediate feedback.

Teaching Assistant Coordinator

I trained, observed, and advised new teaching assistants. In addition, I worked closely with the supervising professor/staff – organizing the course, preparing and distributing course materials, co-writing or proofreading exams, and managing student and instructor issues. I held this position during the Fall 2008, 2009, 2010, & 2012 and Spring 2013 & 2014 semesters.

Grader

- Math 475: Introduction to Combinatorics (Fall 2010)
- Math 210: Topics in Finite Mathematics (Summer 2009)

Summer Collegiate Experience   **Summer 2013**
University of Wisconsin–Madison, Madison, Wisconsin, USA

Pre-calculus Course Coordinator/Instructor

- Oversaw the mathematics instruction of approximately 110 incoming freshman students
- Worked with students to help overcome their math challenges in the hopes of making them more successful during their first semester in college
- Coached students in both one-on-one and group settings
- Developed course plans and materials for modified versions of Fundamental Mathematical Skills, Intermediate Algebra, Algebra, & Trigonometry
- Assisted other instructors in creating inclusive classroom environments

PEOPLE Program   **Summer 2009**
University of Wisconsin–Madison, Madison, Wisconsin, USA

Instructor

- Taught a class of 15 high schoolers in a program designed to help less privileged students get into and through college
- Encouraged the kids to be engaged and start thinking mathematically, but also to have fun while doing it
- Wrote a number of hands-on "experiments" for the entire program to aid students in seeing applications of mathematics in the real world

CLASSROOM TECHNOLOGY	As an instructor/coordinator for College Algebra, Intermediate Algebra, and the Summer Collegiate Experience, I have used the following software in my classroom. I have also trained other instructors on the use of this software.

- MyMathTest (1 semester of experience)
- MyLabsPlus (3 semesters of experience)
- MyMathLab (3 semesters of experience)
- Hawkes Learning Systems (1 semester of experience)

OTHER ACADEMIC EXPERIENCE

Participant, Women and Math Program   **May 2013**
Institute for Advanced Study, School of Mathematics, Princeton, New Jersey, USA

- Participated in an intensive two-week mentoring program which included several lectures and seminars on a variety of topics including matroids, polytopes, and graph theory

Participant, IMMERSE   **Summer 2007**
Department of Mathematics, University of Nebraska–Lincoln, Lincoln, Nebraska, USA

- Took part in a summer experience involving mentoring and intensive study with two courses, one in algebra and one in analysis, which were structured around the reading of research papers rather than around a textbook

Undergraduate Researcher   **Fall 2006**
Department of Mathematics, University of Evansville, Evansville, Indiana, USA

- Worked on a project entitled *On the Non-abelian Tensor Squares of Free Nilpotent Groups* under the direction of Prof. Robert F. Morse

Participant, Research Experience for Undergraduates   **Summer 2006**
Department of Theoretical and Applied Mathematics, University of Akron, Akron, Ohio, USA

- Worked on a project entitled *Wreath Product Finite p-Groups and their Subgroups* under the direction of Prof. Jeffrey Riedl

ADVISING EXPERIENCE

University of Wisconsin–Madison, Madison, Wisconsin, USA

Summer Orientation, Advising, & Registration: Math SOAR Supervisor   **2013**
- Supervised SOAR math consultants and oversaw daily operations
- Managed the math placement advisor e-mail
- Worked with students to resolve a variety of placement and enrollment issues
- Acted as a math consultant at SOAR when other consultants were unavailable

Summer Orientation, Advising, & Registration: Math Consultant   **2011-2012**
- Answered students' questions concerning placement scores, placement tests, mathematics courses, transfer evaluations and AP/IB credits.
- Assisted students in finding and enrolling in sections of various math classes.

Math Registration Help Desk: Employee   **Fall & Spring 2010-2013**
- Answered students' questions concerning placement scores and mathematics courses.
- Assisted students in resolving various registration issues.

TALKS FOR UNDERGRADUATES

A Journey Toward Tridiagonal Pairs, Oberlin College, Oberlin, OH 44074, April 2014

CONFERENCE TALKS	*Tridiagonal pairs of q-Racah type and the quantum enveloping algebra $U_q(\mathfrak{sl}_2)$*, Modern Trends in Algebraic Graph Theory, Villanova University, Villanova, Pennsylvania, June 2014
	Tridiagonal pairs of q-Racah type, the double lowering operator ψ, and $U_q(\mathfrak{sl}_2)$, AMS Southeastern Spring Sectional Meeting, University of Tennessee, Knoxville, Tennessee, March 2014
	Connections between $U_q(sl_2)$ and tridiagonal systems, AMS Central Spring Sectional Meeting, Iowa State University, Ames, Iowa, April 2013
	Connections between $U_q(sl_2)$ and tridiagonal pairs, 2012 Shanghai Conference on Algebraic Combinatorics, Shanghai Jiao Tong University, Shanghai, China, August 2012
	Two commuting operators associated with a tridiagonal pair, 8th Annual Graduate Student Combinatorics Conference, University of Illinois at Urbana–Champaign, Urbana, IL, April 2012
	Two commuting operators associated with a tridiagonal pair, AMS Central Fall Sectional Meeting, University of Nebraska–Lincoln, Lincoln, Nebraska, October 2011
	$U_q(sl_2)$-modules arising from tridiagonal systems, Geometric and Algebraic Combinatorics 5, Oisterwijk, The Netherlands, August 2011
	An operator associated with tridiagonal pairs, Algebraic and Geometric Combinatorics Conference 2010, Gyeongju, South Korea, July 2010
	Normal Subgroups of Wreath Product Finite p-Groups and Corresponding Doubly-Invariant Vector Subspaces, Rose-Hulman Institute of Technology Undergraduate Mathematics Conference, Rose-Hulman Institute of Technology, Terre Haute, IN, March 2007
	Normal Subgroups of Wreath Product Finite p-Groups and Corresponding Doubly-Invariant Vector Subspaces, AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates, MAA-AMS Joint Mathematics Meetings, New Orleans, LA, January 2007
	On the Non-abelian Tensor Squares of Free Nilpotent Groups, 17th Annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics, Argonne National Laboratory, Argonne, IL, November 2006
SEMINAR TALKS	**UW-Madison Combinatorics Seminar**
	Tridiagonal pairs, double lowering operators, and $U_q(\mathfrak{sl}_2)$, April 2014
	Tridiagonal systems and $U_q(\mathfrak{sl}_2)$, March 2014
	Tridiagonal pairs of height one, May 2013
	Connections between $U_q(sl_2)$ and tridiagonal systems, September 2012
	Nomura's refinement of the split decomposition for a tridiagonal systems, February 2012
	$U_q(sl_2)$-modules arising from tridiagonal systems, April 2011
	An operator associated with tridiagonal pairs, August 2010

UW-Madison Lie Theory Seminar
Over five last years, we have been reading papers and books on the representation theory of various quantum groups and related quantum calculus. We took turns giving presentations. I have personally given approximately 30 presentations.

UW-Madison Reading Seminar on Tridiagonal Pairs and Related Topics
From October 2009-May 2014, we have read numerous papers related to tridiagonal pairs, Leonard pairs, distance-regular graphs, quantum groups, and related topics. We took turns giving presentations. I have personally given approximately 50 presentations.

UW-Madison Graduate Student Participation Seminar in Number Theory
On l-adic Representations and Congruences for Coefficients of Modular Forms, April 2009

OTHER PROFESSIONAL & EDUCATIONAL ACTIVITIES	Member of the American Mathematical Society Member of the Association of Women in Mathematics Teaching Assistant Evaluation Committee, 2010-2013 Member/Event organizer for WIMAW (Women in Math at Wisconsin) Peer advisor for New Math Graduate Student Orientation and Registration, 2010 Grader/Volunteer for the University of Wisconsin Mega Math Meet, 2009-2010 Panel member for Dept. of Mathematics TA training, 2009 Organizer/Coordinator for Sidewalk Math, 2008-2011 Volunteer for New Math Graduate Student Orientation, 2008-2010 Penpal to incoming graduate students, 2008-2012 President of the University of Evansville Chapter of Kappa Mu Epsilon, 2006-2007 Cofounder of the University of Evansville Math Club, 2005

REFERENCES

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