

Jeffrey Boerner

CONTACT INFORMATION

MacLean Hall 325L
Department of Mathematics
The University of Iowa
Iowa City, IA 52242 USA

Voice: (319) 621-0839
Fax: (319)-335-0627
E-mail: jboerner@math.uiowa.edu
www: math.uiowa.edu/~jboerner

RESEARCH INTERESTS

Topology, knot theory, with particular interest in link homologies and skein modules

EDUCATION

The University of Iowa, Iowa City, Iowa USA

Ph.D., Mathematics, (expected graduation date: May 2010)

Thesis title: Khovanov homology in thickened surfaces and a study of related skein modules

Advisors: Charles Frohman and Richard Randell

M.S., Mathematics, December 2006

St. Olaf College, Northfield, Minnesota USA

B.A., Mathematics, May, 2002

HONORS AND AWARDS

VIGRE Trainee, Department of Mathematics, 2010 Spring Semester

Outstanding Graduate Student Mentor, The University of Iowa, 2009

VIGRE Trainee, Department of Mathematics, 2007-08 academic year

The University of Iowa, passed Ph.D. qualifying exams with distinction, 2005

St. Olaf College, graduated Magna Cum Laude, 2002

ACADEMIC EXPERIENCE

The University of Iowa

Graduate Student

August, 2004 - present

Includes current Ph.D. research, Ph.D. and Masters level coursework.

VIGRE Trainee

2007-08 Academic Year

Organized Coe College knot theory workshop, organized graduate student topology seminar and 2nd year seminar.

TEACHING EXPERIENCE

The University of Iowa

Instructor

In charge of all aspects of these courses. Lectured, assigned homework, wrote quizzes, assigned grades and held office hours.

- 22M:05 Trigonometry, 22M:02 Algebra

Discussion Section Leader

Led discussion sections, wrote quizzes, assigned grades and held office hours.

- 22M:132 General Topology, 22M:133 Introduction to Smooth Manifolds, 22M:36 Calculus II, 22M:13 Math for Business

The University of Iowa REU mentor

Summer 2008

Helped lead a workshop on Linear Algebra and worked with a professor and three undergraduates on a research project.

PAPERS

2. **Homology of links in thickened surfaces**, 2008, arXiv:0801.3227v1 [math.GT] (submitted)
1. **A homology theory for framed links in I-bundles using embedded surfaces**, Topology and its Applications (2008), doi:10.1016/j.topol.2008.07.018

PAPERS IN
PREPARATION

The Kauffman bracket skein module of T^3

Generalized skein modules of surfaces (with Paul Drube)

A formula for the Kauffman bracket skein module of $L(3, 1)$

The $sl(3)$ skein module

CONFERENCE
PRESENTATIONS

Generalized skein modules. AMS Sectional Meeting special session, Riverside, CA, November, 2009.

Khovanov Homology in thickened surfaces. Knots in Washington, George Washington University, April, 2008.

Link homology in thickened surfaces. AMS Sectional Meeting special session, Baton Rouge, LA, March, 2008.

Khovanov Homology of Links Embedded in I-Bundles. Workshop on Knot Theory and Quantum Computing, UT Dallas, December, 2007.

Khovanov Homology of Links Embedded in I-Bundles. Knots in Washington, George Washington University, December, 2007.

Khovanov Homology of Links Embedded in I-Bundles. Knotting Art and Mathematics Conference, USF, Tampa, FL, November, 2007.

CONFERENCES
ATTENDED

Knots in Washington, George Washington University, January, 2009

Workshop on Low Dimensional Topology, MSRI, 2008

COLLOQUIUM
TALKS

Knots and their invariants. St. Olaf College Mathematics Department Colloquium, March 2009.

An introduction to knot invariants. Boise State University Mathematics Department Colloquium, October 2008.

OTHER TALKS

- **Knots and their invariants**, University of Iowa summer REU, Summer 2009
- **Heegaard Floer homology for (1,1) knots**, Topology seminar, 2009
- **Constructing the Witten-Reshitikhin-Turaev invariant**, Graduate student topology seminar, 2008
- **The Kauffman bracket skein module of $L(3, 1)$** , Topology seminar, 2008
- **Property P for satellite knots**, Sutured Floer Homology seminar, 2008
- **Introduction to virtual knots**, Topology seminar, 2008
- **Introduction to quandles**, Graduate student topology seminar, 2008
- **$sl(3)$ link homology**, Topology seminar, 2008

- **The Jones polynomial and the Temperley-Lieb algebra**, Graduate student topology seminar, 2007
- **Khovanov homology of links embedded in I-bundles**, LSU-Iowa virtual seminar, 2007
- **Khovanov homology in thickened surfaces**, Topology seminar, 2007
- **Properties of the Jones polynomial**, Graduate student topology seminar, 2007
- **Khovanov homology in I-bundles**, Khovanov homology seminar, 2006
- **Torsion of Khovanov homology**, Khovanov homology seminar, 2006
- **Khovanov homology**, Graduate student topology seminar, 2006

SERVICE

Math Graduate Board (General Liaison), The University of Iowa, 2008

Sonya Kovalevsky Day (volunteer), The University of Iowa, 2008

REFERENCES

Charles Frohman, University of Iowa, frohman@math.uiowa.edu

Richard Randell, University of Iowa, randell@math.uiowa.edu

Oguz Durumeric, University of Iowa, odurumer@math.uiowa.edu

Uwe Kaiser, Boise State University, kaiser@diamond.boisestate.edu