

# Geir Helleloid

## Curriculum Vitæ

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Department of Mathematics  
The University of Texas at Austin  
1 University Station, C1200  
Austin, TX 78712-0257

Phone: (650) 387-1417  
Fax: (512) 471-9038  
Email: [geir@math.utexas.edu](mailto:geir@math.utexas.edu)  
Website: <http://www.math.utexas.edu/~geir>  
Citizenship: US

**Mathematical Research Interests.** Broadly speaking, I am interested in combinatorics, probability, representation theory, and group theory. Part of my Ph.D. thesis uses combinatorial representation theory to prove probabilistic results on finite  $p$ -groups. Currently my research focuses on answering probabilistic questions (often about random walks) using algebraic and combinatorial machinery, especially symmetric function theory (and more generally the representation theory of finite groups).

### Employment.

2007 – Present      Bing Instructor, University of Texas at Austin  
*Postdoctoral fellow*

### Education.

2002 – 2007      Stanford University, Ph.D. in Mathematics  
*Advisor: Persi Diaconis*  
*Thesis: Automorphism Groups of  $p$ -Groups: Structure and Applications*

1998 – 2002      University of Wisconsin – Madison, B.S.  
*Double major in Mathematics and Computer Science*  
*Graduated with Comprehensive Honors*

### Publications and Preprints.

- (1) (with M. Khalid, D. Moulton, and P. Matchett Wood) *Graph pegging numbers*, to appear in Discrete Mathematics. Also available at arXiv:0804.1095 [math.CO].
- (2) (with U. Martin) *The automorphism group of a finite  $p$ -group is almost always a  $p$ -group*, J. Algebra **312** (2007), no. 1, 294–329. Also available at arXiv:math.GR/0602039.
- (3) *Automorphism Groups of Finite  $p$ -Groups: Structure and Applications*, Ph.D. thesis, available at arXiv:0711.2816v1 [math.GR].
- (4) *Connected triangle-free  $m$ -step competition graphs*, Discrete Applied Mathematics **145** (2005), no. 3, 376–383.
- (5) (with F. King, G. Smethells, and P. Pelzl) *Numerical evaluation of Hilbert transforms for oscillatory functions: a convergence accelerator approach*, Computer Physics Communications **145** (2002), no. 2, 256–266.
- (6) *On the Computation of Viscosity-Shear Rate Temperature Master Curves for Polymeric Liquids*, The Morehead Electronic Journal of Applicable Mathematics **1** (2001), 1–11.

### Teaching Activities.

Fall 2007 – Fall 2008      Lecturer, University of Texas at Austin  
*Courses: Calculus I, Calculus II, Probability,*  
*Algebraic Combinatorics (graduate class),*  
*Algebra (independent study)*

Summer 2007      Course Assistant, Stanford University  
*Course: Linear Algebra*

Winter 2007      Lecturer, Stanford University  
*Course: Calculus I*

Winter 2006, Spring 2006	Teaching Assistant, Stanford University <i>Courses: Calculus II, Differential Equations</i>
Summers 2005, 2006	Lecturer, Stanford University <i>Courses: Calculus I (and II, unofficially, to interested students)</i>
Fall 2005, Spring 2007	Course Assistant, Stanford University <i>Course: Combinatorics</i>
Fall 2000 – Spring 2002	Teaching Assistant, University of Wisconsin – Madison <i>Courses: Calculus I, Calculus II</i> <i>Teaching performance designated “Superior” by the university</i> <i>First undergraduate teaching assistant at the University of Wisconsin – Madison in over 15 years</i>

**Talks.**

January 2009 (upcoming)	<i>Joint Mathematics Meetings</i> , Washington D.C.
December 2008 (upcoming)	<i>Saturday Morning Math Group</i> , U. of Texas at Austin
November 2008 (upcoming)	<i>Department Colloquium</i> , Case Western Reserve U.
September 2008	<i>ANC Seminar</i> , U. of Texas at Austin
July 2008	<i>Summer Math Workshop</i> , U. – Eau Claire
April 2008	<i>Undergraduate Math Club</i> , U. of Texas at Austin
February 2008	<i>Algebra and Combinatorics Seminar</i> , Texas A&M
July 2007	<i>Communicating Mathematics Conference</i> , U. of Minnesota Duluth
May 2007	<i>Algebra Seminar</i> , U. of Texas at Austin
January 2007	<i>Joint Mathematics Meetings</i> , New Orleans, Louisiana
June 2006	<i>Duluth REU</i> , U. of Minnesota Duluth
April 2006	<i>Graduate Combinatorics Conference</i> , U. of Wisconsin – Madison
February 2006	<i>Representation Theory Seminar</i> , Queen Mary U. of London
November 2005	<i>Representation Theory Seminar</i> , Stanford U.
October 2005	<i>Graduate Student Colloquium</i> , Stanford U.
April 2005	<i>Graduate Student Combinatorics Conference</i> , U. of Minnesota
November 2004	<i>Representation Theory Seminar</i> , Stanford U.
October 2004	<i>Graduate Student Colloquium</i> , Stanford U.
January 2004	<i>Graduate Student Colloquium</i> , Stanford U.
January 2004	<i>Joint Mathematics Meetings</i> , Phoenix, Arizona
April 2003	<i>Algebra Seminar</i> , Stanford U.
March 2002	<i>Combinatorics Seminar</i> , U. of Wisconsin – Madison
January 2002	<i>Joint Mathematics Meetings</i> , San Diego, California

**Academic and Professional Activities.**

January 2009 – 2012 (upcoming)	<i>Committee Member</i> , MAA Committee on Graduate Students
January 2009 – 2012 (upcoming)	<i>Committee Member</i> , MAA CUPM Subcommittee on Research by Undergraduates
August 2008	<i>Co-organizer</i> , MathFest Project NExT Session <i>Panel Discussion on “Integrating Interdisciplinary Applications into Courses”</i>
Fall 2007 – Present	Project NExT Fellow
Fall 2007 – Present	<i>Organizer</i> , Algebra, Number Theory, and Combinatorics Seminar, University of Texas at Austin
Fall 2006 – Summer 2007	<i>Assistant</i> , 65th Birthday Conference for Joseph A. Gallian
Fall 2005 – Spring 2006	<i>Calculus and Combinatorics Tutor</i> , Stanford University

Fall 2004 – Spring 2007	<i>Liaison</i> , Center for Teaching and Learning at Stanford University <i>Activities include organizing teaching lunches in the Department of Mathematics designed to encourage teaching innovation, interest, and dialogue</i>
Summers 2004 – 2008	<i>Research visitor</i> , University of Minnesota Duluth REU <i>NSF- and NSA-funded research experience for undergraduates</i>
Summer 2004	<i>Participant</i> , Park City Mathematics Institute Summer School on Geometric Combinatorics
Fall 2003 – Spring 2004	<i>Co-organizer</i> , Graduate Student Colloquium, Stanford University
Summers 2002, 2003	<i>Research advisor</i> , University of Minnesota Duluth REU
Summer 2001	<i>Participant</i> , University of Minnesota Duluth REU
Summer 2000	<i>Participant</i> , Cornell University REU
Fall 1999 – Spring 2002	<i>Mathematics and Computer Science Tutor</i> , University of Wisconsin – Madison, MathLab and GUTS tutoring services
Journals refereed:	Journal of Combinatorial Theory Series A The Ramanujan Journal Discrete Mathematics Discrete Applied Mathematics

**Academic Honors.**

2002	National Defense Science and Engineering Graduate Fellowship
2002	Outstanding Honors Student Award, University of Wisconsin – Madison
2000	Barry M. Goldwater Scholar <i>Nationwide scholarship awarded for mathematical, scientific, or engineering studies</i>