

Anton Dochtermann

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EDUCATION

- **Ph.D. in mathematics**, University of Washington (August 2007). Thesis title: *The topology of graph homomorphisms*.
RESEARCH INTERESTS: Topological and algebraic combinatorics, commutative algebra, discrete geometry.
ADVISORS: Professors Eric Babson and Isabella Novik.
- **B.A. in mathematics**, minor in art practice, UC Berkeley (December 2000).

EMPLOYMENT

- Fall 2010 - current: NSF funded MSRI postdoctoral position at Stanford University, under Professor Gunnar Carlsson.
- May - June 2010: TU Berlin visiting postdoctoral researcher, supported by Alexander von Humboldt research fellowship.
- September 2009 - May 2010: Research Scholar, Department of Mathematics, Dartmouth College.
- October 2007 - August 2009: Postdoctoral researcher in the Discrete Geometry Group, Technische Universität Berlin (under Günter M. Ziegler), supported by DAAD research grant and Alexander von Humboldt postdoctoral research fellowship.
- Fall 2001 - Summer 2007: Graduate student instructor, University of Washington (see below for courses).
- Fall 2006 - Summer 2007 and Winter - Summer 2004, NSF VIGRE graduate fellow.

TEACHING

(all while at the University of Washington unless otherwise indicated)

- Summer 2008, Tutorials for BMS Topology II class, TU Berlin.
- Winter 2006 and Summer 2006, Instructor for Math 308, *Matrix algebra* (with full responsibilities including lectures, office hours, exams, etc.).
- Fall 2004, Spring 2005, and Winter 2007, Instructor for Math 307, *Intro to Differential Equations* (with full responsibilities).

- Summer 2003, Instructor for Math 124, *Differential calculus* (with full responsibilities).
- Fall 2002, Mentor for Math 124 first-year teaching assistants.
- Fall 2001 - Winter 2005, Several quarters as a teaching assistant for calculus classes.
- Fall 2000 - Undergraduate student instructor for Math 1A calculus, UC Berkeley.

PUBLICATIONS

- (1) *Coarse tropical type decompositions and associated cellular resolutions*, with Michael Joswig and Raman Sanyal, submitted to J. Reine Angew. Math., arXiv:1001.0237, 26 pages.
- (2) *Cellular resolutions of cointerval ideals*, with Alexander Engström, to appear in Math. Z., arXiv:1004.0713, 21 pages.
- (3) *Algebraic properties of edge ideals via combinatorial topology*, with Alexander Engström, Electron. J. Combin., Volume 16(2), 2009 (Björner Festschrift volume), 23 pages.
- (4) *Topology of Hom complexes and test graphs for bounding chromatic number*, with Carsten Schultz, to appear in the Israel J. Math., arXiv:0907.5079, 41 pages.
- (5) *Homotopy groups of Hom complexes of graphs*, J. Combin. Theory Ser. A, Volume 116, Issue 1, January 2009, 180-194.
- (6) *The universality of Hom complexes of graphs*, Combinatorica, 29 (4), 2009, 433-448.
- (7) *Hom complexes and homotopy in the category of graphs*, European J. Combin., Volume 30, Number 2, February 2009, 490-509.
Extended abstract appeared in Electron. Notes Discrete Math., Volume 31, 20 August 2008, 131-136, The International Conference on Topological and Geometric Graph Theory.
- (8) *Graphs with disjoint links in every spatial embedding*, with Stephen Chan, et al., J. Knot Theory Ramifications, 13 (2004), no. 6, 737-748.
- (9) *Graphical groups and related constructions*, in preparation, 15 pages.
- (10) *Face rings of cycles, associahedra, and standard tableau*, in preparation, 15 pages.
- (11) *Cellular resolutions via mapping cones*, with Fatemeh Mohammadi, in preparation, 10 pages.

CONFERENCE, SEMINAR, AND COLLOQUIUM TALKS

- (1) *Relating topological and probabilistic bounds on chromatic number*
 - TU Berlin Discrete Geometry Seminar, May 11, 2010.
 - UC Berkeley Student Discrete Math Seminar, Nov 10, 2010.
- (2) *Complements of cycles, tableau, and associahedra*

- TU Berlin Discrete Geometry Seminar, June 17, 2010.
 - UC Davis Combinatorics Seminar, February 4, 2011.
- (3) *Coarse tropical type decompositions and associated cellular resolutions*
- U Washington Combinatorics Seminar, April 29, 2009.
 - AMS Sectional Meeting, San Francisco, Special Session on Matroids in Algebra and Geometry, April 25, 2009.
 - TU Berlin Discrete Geometry Seminar, April 9, 2009.
- (4) *Cellular resolutions of cointerval graphs and hypergraphs*
- U Washington Combinatorics Seminar, October 13, 2010.
 - U Miami Combinatorics Seminar, October 4, 2010.
 - New Mexico State University Algebra Seminar, February 3, 2010.
 - Dartmouth College Combinatorics Seminar, October 5, 2009.
 - TU Berlin Discrete Geometry Seminar, October 9, 2008.
- (5) *Combinatorics and geometry in the resolutions of monomial ideals*, New Mexico State U Math Department Colloquium, February 4, 2010.
- (6) *Graph homomorphisms and reflection positivity*, TU Berlin Discrete Math Seminar, March 18, 2009.
- (7) *Topology of graph homomorphisms and functorial graph parameters*, Graph limits, Homomorphisms, and Structures Workshop held at Hranicni Zamecek, Czech Republic, January 30, 2009.
- (8) *What is homotopical algebra?*, Berlin Mathematical School ‘What is...’ Seminar, October 31, 2008.
- (9) *Duality in homomorphism complexes of graphs*, Midsummer Combinatorial Workshop, Charles University, Prague, July 28 - August 1, 2008.
- (10) *Hom complexes and homotopy in the category of graphs*, Topological and Geometric Graph Theory Conference, Paris, May 21, 2008.
- (11) *Test graphs for topological lower bounds on chromatic number*, MDS Graduiertenkolleg colloquium, Berlin, May 5, 2008.
- (12) *Betti number of edge ideals of graphs*, TU Berlin MittagsSeminar, March 13, 2008.
- (13) *Foldings and the topology of graph homomorphisms*, TU Berlin Discrete Math Seminar, February 6, 2008.
- (14) *Poset topology*, U Washington Current Problems Seminar, March 1, 2007.
- (15) *Hom complexes and the topology of graph maps*
- New Mexico State U Topology Seminar, February 3, 2010.
 - Dartmouth College Combinatorics Seminar, November 9, 2009.

- U Washington Combinatorics Seminar, January 17, 2007.
- (16) *Paths, homotopy, and Hom complexes in the category of graphs*
- SFSU Algebra-Geometry-Combinatorics seminar, Oct 27, 2006.
 - UC Berkeley Combinatorics Seminar, Oct 23, 2006.
 - Poster presented at the Workshop on Geometric and Topological Combinatorics, Alcalá de Henares, August 31-September 5, 2006.
- (17) *The universality of Hom complexes*, Workshop on topological methods in combinatorics, MSRI, Oct 6, 2006.
- (18) *Some topological constructions in graph theory*, ‘Trends in Topological Combinatorics’ at KTH-Stockholm, Sweden, Feb 15, 2005.
- (19) *Graphs with disjoint links in every spatial embedding*, AMS Special Session on Knots, Links, and Embedded Graphs at UNC, October 25, 2003.
- (20) *Links and knots in the spatial embeddings of graphs*, U Washington Combinatorics/Geometry Seminar, December 4, 2002.

HONORS AND AWARDS

- Alexander von Humboldt-Foundation postdoctoral fellowship, 2008-9.
- NSF VIGRE fellowship, 2003 and 2006.
- University of Washington *Carl B. Allendoerfer Academic Excellence Award* (for outstanding performance in core courses and preliminary exams), 2002.
- Mentor for first-year instructors at the University of Washington (duties included organizing a week long training session as well as mentorship of four incoming grad students), Fall 2002.
- UC Berkeley Honors Program in Mathematics, December 2000.
- UC Berkeley Dean’s Honor List - Spring, Fall 2000.

OTHER ACTIVITIES

- Refereeing: Journal of Combinatorial Theory, Series A; European Journal of Combinatorics; Electronic Journal of Combinatorics; Topology and Its Applications; Discrete Mathematics; Journal of Algebraic Combinatorics.
- Co-organizer (with Alex Engström) of *Topological Combinatorics Seminar*, Fall 2010 and Spring 2011, UC Berkeley.
- Organizer of weekly *Algebraic Combinatorics Seminar*, TU Berlin, Summer 2008.
- Co-organizer (with Brant Jones, Matt Kahle, and Beth Morris) of the 2007 *Graduate Student Seminar*, held at the University of Washington, April 21-22, 2007.

- Co-organizer of the U Washington *Student Combinatorics Seminar*, 2004 - 2007.
- Chair of the VIGRE website committee (duties include maintaining the University of Washington's VIGRE website), 2003 and 2006.

REFERENCES

- ERIC BABSON (co-advisor)
Professor, University of California, Davis
babson@math.ucdavis.edu
- ISABELLA NOVIK (co-advisor)
Associate Professor, University of Washington
novik@math.washington.edu
- DMITRY FEICHTNER-KOZLOV
Professor, University of Bremen
dfk@math.uni-bremen.de
- GÜNTER M. ZIEGLER
Professor, TU Berlin
ziegler@math.tu-berlin.de
- KEN BUBE (teaching reference)
Professor, University of Washington
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