

Maria Belk

Curriculum Vitae

Department of Mathematics

Bard College

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Education:

- **Cornell University, Ph.D.**, Mathematics, August 2005.
Applications of Stress Theory: Realizing Graphs and Kneser-Poulsen
Advisor: Robert Connelly
- **Cornell University, M.S.**, Mathematics, May 2002.
- **Carleton College, B.A.**, Mathematics, June 1999.
Magna Cum Laude with distinction in mathematics

Professional Experience

- **Bard College**, Director of Quantitative Literacy, January 2009 – Present.
- **Bard College**, Visiting Assistant Professor, Mathematics Program, September 2008 – Present.
- **Texas A&M University**, Visiting Assistant Professor, Department of Mathematics, August 2005 – August 2008.

Research Interests

- Discrete Geometry, Computational Geometry, Graph Theory

Publications and Preprints

- Monotonicity of the volume of the union of four balls in hyperbolic space. Submitted to *Contributions to Discrete Mathematics*.
- Making contractions continuous: a problem related to the Kneser-Poulsen conjecture (with Robert Connelly). Submitted to *Contributions to Discrete Mathematics*.
- Realizability of graphs (with Robert Connelly). *Discrete and Computational Geometry*. 37 (2007), no. 2, 125-137.
- Realizability of graphs in three dimensions. *Discrete and Computational Geometry*. 37 (2007), no. 2, 139-162.

Teaching at Bard College

- **Courses Taught:** Algebra Workshop (2 sections), Precalculus Workshop, Precalculus ($\times 3$), Calculus II, Graph Theory.
- **Senior Projects:** Tina Zhang (Graph Theory), Xinyuan Xu (Actuarial Science).
- **Tutorial:** Algebra tutorial for a student with a learning disability (Fall 2009).
- **HEOP Workshop:** Instructor for 2-week math workshop for HEOP students in July 2009.
- **Course Development:** Designed ARC 150 (Algebra Workshop) and ARC 190 (Precalculus Workshop) with the help of the Q-committee.

Teaching at Texas A&M University

- **Courses Taught:** Graduate Engineering Mathematics (linear algebra and vector calculus, $\times 3$), Differential Equations (used Matlab in class and on tests, 2 sections), Engineering Calculus II (70 students, supervised a TA), Linear Algebra (2 sections), Business Mathematics I (2 sections).

Teaching at Cornell University

- **Courses Taught:** Calculus II ($\times 2$).
- **Teaching Assistant at Cornell University:** Teaching Assistant for several courses, including Engineering Calculus II, Multivariable Calculus, and Linear Algebra, between Fall 1999 and Spring 2005.
- **Grader at Cornell University:** Grader for 4 courses between Summer 2000 and Fall 2004: Math 294 (Engineering Mathematics II), Math 452 (Classical Geometries), Math 336 (Applicable Algebra), and Math 455 (Applicable Geometry).
- **Assistant to the Course Coordinator at Cornell University:** Aided the course coordinator for Math 192 in Fall 2001 and for Math 112 in Fall 2002.
- **Mathematics Content Liaison for Academic Excellence Workshop:** Aided communication between the mathematics department and undergraduate led collaborative learning sessions, Fall 2001, Cornell University.

Undergraduate Research Experience

- Supervisor for two senior projects at Bard college.
- Helped supervise a research group of four undergraduate students at Bard college during the summer of 2009.
- Participant in the 1998 Rose-Hulman Institute of Technology REU.

Service at Bard College

- **Math and Science Tutors:** Coordinated the math and science tutors, Spring 2009 to Present.
- **Math Study Room:** Coordinated the Math Study Room, Fall 2008 to Present.
- **Math Placement Diagnostic:** Designed and implemented the Math Placement Diagnostic for the 2009-2010 first-year students with the help of the Q-committee.
- **Superadvising:** Advised and registered first-year students, August 28-29, 2009.

Conferences Organized

- **Mid-Hudson Mathematics Conference for Undergraduates:** Co-organizer, Fall 2009.
- **Discrete Mathematics Day at Bard College:** Co-organizer, Fall 2008.

Outreach

- **Workshop at the Bard Math and Science Day:** Organized and led an activity on the Prisoner's Dilemma for middle school and high school students attending The Bard Math and Science Day (organized by the Bard Math Circles).
- **Co-organizer and facilitator for "Expanding Your Horizons" math workshops:** Organized and led hands-on activities on topology, symmetry, the game of Nim, probability, and minimal surfaces for middle school girls. April 2000-2005 at Cornell University, and October 2006 and December 2007 at Texas A&M University.
- **Graduate Assistant for Math Explorers Club:** Assisted professors in leading modules. Designed and led computer activities for high school students. Fall 2000-Spring 2002.

Honors and Grants

- AWM Workshop for Women Graduate Students and Recent Ph.D.'s at the Joint Mathematics Meeting, January 2005.
- NSF VIGRE Grant, Spring 2001. Funding to design and lead computer activities for Math Explorers Club, a program run by the Cornell math department for high school students.
- NSF VIGRE Grant, Summer 2000 and 2001, Ph.D. research.

Conference Talks

- “Realizability of Graphs”, Discrete Math Day, Bard College, November 2008.
- “Making Your House Safe from Zombie Attacks”, Joint Mathematics Meetings, San Diego, January 2008.
- “Realizing Graphs”, Discrete Geometry and Topology in Low Dimensions, Banff International Research Station, April 2007.
- “Realizability of Graphs”, Horizon of Combinatorics, July 2006.
- “Realizability of Graphs”, Discrete Geometry session, Canadian Mathematical Society Meeting, December 2004
- “Realizability of Graphs”, Modeling Protein Flexibility and Motions, Banff International Research Station, July 2004.

Conference Poster

- “Realizability of Graphs”, AWM Workshop for Women Graduate Students and Recent Ph.D.’s, Joint Mathematics Meetings, January 2005.

Seminar Talks

- “Rigidity and Flexibility of Structures”, Bard College Mathematics Seminar, December 2008.
- “Problems related to the Kneser-Poulsen conjecture”, Texas A&M Algebra and Combinatorics seminar, September 2007.
- “Making Your House Safe from Zombie Attacks”, Texas A&M Postdoc Colloquium, October 2006.
- “Realizability of Graphs”
 - SMPosium, Carleton College, June 2007.
 - Texas A&M Algebra and Combinatorics seminar November 2005.
 - Texas A&M Postdoc Colloquium, October 2005.
 - Binghamton University Combinatorics Seminar, Fall 2004.
 - Cornell Discrete Geometry and Combinatorics seminar, Fall 2004.
 - Cornell graduate student colloquium, November 2003.
- “Problems related to the Kneser-Poulsen conjecture in hyperbolic space”
 - Cornell Discrete Geometry and Combinatorics seminar, Fall 2003.
 - University of Calgary summer discrete geometry seminar, July 2003.
- “Polytopes and the Colin de Verdière number”, Cornell Discrete Geometry and Combinatorics seminar, Fall 2001.