Heather C. Smith

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My primary interests lie in combinatorics and graph theory. Current projects include topics of computational complexity, finite set systems and posets, extremal problems on trees, games on graphs, and network modeling.

Education

Aug. 2010– present	**Ph.D. Student in Mathematics (expected Summer 2015)** *University of South Carolina*, Columbia, SC Dissertation: Trees, Partitions, and Other Combinatorial Structures Advisor: László Székely
Aug. 2008– May 2010	**M.S. in Mathematics** *Virginia Commonwealth University*, Richmond, VA Thesis: Zero Divisors among Digraphs Advisor: Professor Richard Hammack
Aug. 2005– May 2008	**B.A. in Mathematics** *Houghton College*, Houghton, NY Graduated Summa Cum Laude
Aug. 2005– May 2008	**B.A. in Adolescence Education** *Houghton College*, Houghton, NY Graduated Summa Cum Laude

Publications

6. I. Miklós and H. Smith. "Complexity Results for the Single Cut-or-Join Model," *In preparation*.

5. S. Behrens, F. Kenter, T. Mahoney, K. Monfared, K. Nowak, H. Smith, and M. Young. "Lower Bounds on the Zero Forcing Number of Graphs," *In preparation*.

4. H. Smith, L. A. Székely, H. Wang, and S. Yuan. "Different Middle Parts of Trees," *In preparation*.

3. H. Smith, L. A. Székely, and H. Wang. "Eccentricity in Trees," *arXiv:1408.5865, submitted to the Electronic Journal of Combinatorics*, 2014.

2. H. Smith and L. A. Székely "Some Remarks on Baranyai's Theorem," *Congressus Numerantium, to appear*, 2014.

1. R. Hammack and H. Smith. "Zero Divisors among Digraphs," *Graphs and Combinatorics* 30.1, (2014): 171-181. (*Published on-line DOI:10.1007/s00373-012-1248-x*, 2012)

Academic Positions

University of South Carolina, Columbia, SC

Fall 2014– Spring 2015	**Dean's Doctoral Dissertation Fellow** *Awarded by the College of Arts and Sciences,* University of South Carolina, Columbia, SC
Spring 2011- Spring 2014	**Graduate Instructor of Record** *Full responsibility for the course which includes preparing and giving lectures, writing tests, grading all student work, holding office hours, and assigning course grades* ○ MATH 111: Basic College Mathematics (Spring 2011) ○ MATH 115: Precalculus Mathematics (Spring 2012) ○ MATH 122: Business Calculus (Spring 2013) ○ MATH 141: Calculus I (Fall 2012, Fall 2013) ○ MATH 241: Vector Calculus (Summer 2011, Fall 2011, Summer 2013) ○ MATH 374: Discrete Structures (Spring 2014)

Fall 2011- Spring 2014	**Tutor in the Math Department Tutoring Center** *Two hours per week answering homework questions for lower-level courses*
Fall 2010, Fall 2013	**Graduate Teaching Assistant for MATH 142: Calculus II** *Meet students weekly for recitation to answer homework questions and give quizzes, teach a computer lab with Maple, hold office hours*

Virginia Commonwealth University, Richmond, VA

Summer 2010	**Adjunct Instructor for Calculus I MATH 161** *Full responsibility for the course including preparing and giving lectures, writing tests, grading student work, and assigning course grades*
Fall 2008- Spring 2010	**Graduate Instructor of Record** *Full responsibility for the course including preparing and giving lectures, writing tests, grading student work, and assigning course grades* ○ MATH 141: Algebra with Applications (Fall 2008, Spring 2009) ○ MATH 151: Precalculus Mathematics (Fall 2009, Spring 2010)

Houghton College, Houghton, NY

Spring 2006- Spring 2008	**Undergraduate Teaching Assistant** *Grade homeworks, meet students weekly to answer homework questions, hold test review sessions* ○ MATH 181: Calculus I (Spring 2006, Spring 2007) ○ MATH 261: Linear Algebra (Spring 2008)

Self-Employed

Spring 2007- present	**Private mathematics tutor** *Meet individual students to answer homework questions and help them prepare for exams in many courses which include the following* ○ MATH 300: Transition to Advanced Mathematics ○ MATH 544: Linear Algebra ○ MATH 546: Algebraic Structures I ○ MATH 574: Discrete Mathematics

Honors and Awards

Fellowships

2015	Travel Grant for the Joint Mathematics Meetings from the AMS ($800)
2014	Travel Grant for the AMS Sectional Meeting, Greensboro, NC from the AMS ($230)
2014	Travel Award from the AMS for research visit to University College London and Oxford University ($750)
2014-2015	Dean's Doctoral Dissertation Fellowship from the College of Arts and Sciences of the University of South Carolina. ($25,000)
2014	Fully funded participant: Rocky Mountain–Great Plains Graduate Research Workshop in Combinatorics ($950 and lodging)
2014	Fully funded participant: Mathematics Research Communities in Network Science ($650 in addition to meals and lodging)
Summer 2014	Research Assistantship from NSF DMS contract #1300547 ($4,000)
2013	SPARC Graduate Fellowship from the Office of the Vice President for Research at the University of South Carolina ($5,000)
Summer 2012	Research Assistantship from the National Science Foundation NSF DMS contract #1000475 ($3,200)

Awards

Apr. 2013	"2012-2013 Outstanding Graduate Teaching Assistant" awarded by the Department of Mathematics, University of South Carolina, Columbia, SC
Mar. 2011	"2010-2011 Outstanding First Year Graduate Student" awarded by the Department of Mathematics, University of South Carolina, Columbia, SC

Mar. 2007	"Outstanding Junior Student 2006/2007" awarded by the Department of Mathematics, Houghton College, Houghton, NY

Other

Fall 2014	2 day research visit to University College London and Oxford University, sponsored by the AMS, to collaborate with Valentin Danchev and Beate Franke
Fall 2014	4 week research visit to the the Alfréd Rényi Institute of Mathematics of the Hungarian Academy of Sciences, sponsored by the College of Arts and Sciences of the University of South Carolina, to collaborate with István Miklós
Summer 2013	4 week research visit to the Alfréd Rényi Institute of Mathematics of the Hungarian Academy of Sciences, sponsored by the provost of the University of South Carolina, to collaborate with István Miklós and Péter Erdős
Fall 2012	Elected student representative to the Graduate Advisory Council 2012/2013, Department of Mathematics, University of South Carolina

Presentations

Invited Conference Talks

11 Jan. 2015	**Sampling Single Cut-or-Join Scenarios (20 min.)** *AMS Special Session on Network Science, 2015 Joint Mathematics Meetings*, Henry B. Gonzalez Convention Center, San Antonio, TX
24 Oct. 2014	**Zero Forcing: The Spread of Infection on a Graph (20 min.)** *Carolina Math Seminar*, Columbia College, Columbia, SC
27 Apr. 2013	**Zero Divisors among Digraphs (15 min.)** *Mini-Conference on Graduate Research*, Georgia Southern University, Statesboro, GA

Seminar Talks

30 Apr. 2014	**Approximating the Number of Double Cut-and-Join Scenarios (60 min.)** *SIAM Student Chapter*, University of South Carolina, Columbia, SC
22 Mar. 2013	**The Lovász Isotopy Lemma (60 min.)** *Algebra and Logic Seminar*, University of South Carolina, Columbia, SC
1 Mar. 2013	**Results of Lovász Concerning Direct Products (60 min.)** *Algebra and Logic Seminar*, University of South Carolina, Columbia, SC
30 Apr. 2010	**Math and Origami (60 min.)** *Graduate Student Seminar*, Virginia Commonwealth University, Richmond, VA
5 Feb. 2010	**Extensions of the Pythagorean Theorem (60 min.)** *Analysis seminar*, Virginia Commonwealth University, Richmond, VA

Other

9 Nov. 2014	**Eccentricity in Trees (10 min.)** *AMS Fall Southeastern Section Meeting*, University of North Carolina, Greensboro, NC
1 Aug. 2014	**Pseudo-winning teams in Digraphs (15 min.)** *Rocky Mountain–Great Plains Graduate Research Workshop in Combinatorics* University of Denver, Denver, CO
25 Jun. 2014	**Approximating the Number of Single Cut-or-Join Scenarios (10 min.)** *AMS Mathematics Research Community on Network Science* Snowbird Ski and Summer Resort, Snowbird, UT
11 Apr. 2014	**Markov Chains and the Single Cut-or-Join Model (15 min.)** *17th Annual Graduate Student Day*, University of South Carolina, Columbia, SC
5 Apr. 2014	**Baranyai Partitions and the Anti-Baranyai Theorem (25 min.)** *10th Graduate Student Combinatorics Conference*, Auburn University, Auburn, AL
6 Mar. 2014	**Constructing Baranyai Partitions (15 min.)** *The 45th Southeastern International Conference on Combinatorics, Graph Theory, and Computing*, Florida Atlantic University, Boca Raton, FL

19 Apr. 2010	**Zero Divisors among Digraphs (45 min.)**
	Public Defense of Master's Thesis, Virginia Commonwealth University, Richmond, VA

Professional Service

2 Oct. 2014	**Presentation about the Beauty of Mathematics Research (45 min.)**
	High school senior class.
	International Christian School of Budapest, Diósd, Hungary
2013-2014	**Proctor for the 27th and 28th High School Mathematics Competition**
	University of South Carolina, Columbia, SC
2013-2014	**Judge for the 11th and 12th Annual Integration Bees**
	Pi Mu Epsilon Alpha Chapter and Gamecock Math Club
	University of South Carolina, Columbia, SC
2012-2013	**Co-referee with advisor for the following journals:**
	○ *Moscow Journal of Combinatorics and Number Theory*
	○ *Electronic Journal of Combinatorics*
	○ *Central European Journal of Mathematics*
2012	**Mentor with the Women's Mentoring Program**
	University of South Carolina, Columbia, SC
2011, 2014	**Proctor for the AP Examination**
	University of South Carolina, Columbia, SC

Memberships

- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM)
- Gamecock Math Club at the University of South Carolina, Columbia, SC
- Association for Women in Mathematics (AWM)

Summer Schools/Workshops Attended

Fully-funded Participant

27 Jul.-8 Aug. 2014	**Rocky Mountain–Great Plains Graduate Research Workshop in Combinatorics**
	University of Denver and University of Colorado Denver, Denver, CO
25-29 Jun. 2014	**AMS Mathematics Research Community on Network Science**
	Snowbird Ski and Summer Resort, Snowbird, UT

Other

20-31 May 2013	**Summer School in Network Science**
	University of South Carolina, Columbia, SC

Conferences Attended

10-13 Jan. 2015	**2015 Joint Mathematics Meetings**
	Henry B. Gonzalez Convention Center, San Antonio, TX
8-9 Nov. 2014	**AMS Fall Southeastern Section Meeting #1105**
	University of North Carolina, Greensboro, NC
24 Oct. 2014	**Carolina Math Seminar**
	Columbia College, Columbia, SC
26 Apr. 2014	**Atlanta Lecture Series in Combinatorics and Graph Theory XII**
	Georgia Institute of Technology, Atlanta, GA

4-5 Apr. 2014	***Graduate Student Combinatorics Conference*** Auburn University, Auburn, AL
3-7 Mar. 2014	**The 45th Southeastern Int. Conference on Combinatorics, Graph Theory and Computing** Florida Atlantic University, Boca Raton, FL
22 Feb. 2014	**The 9th Triangle Lectures in Combinatorics** University of North Carolina, Chapel Hill, NC
20-21 Sep. 2013	**The 8th Triangle Lectures in Combinatorics** North Carolina State University, Raleigh, NC
1-5 Jul. 2013	**Erdős Centennial Conference** The Alfréd Rényi Institute of Mathematics, Budapest, Hungary
24-28 Jun. 2013	**Random Walks: Crossroads and Perspectives** The Alfréd Rényi Institute of Mathematics, Budapest, Hungary
27 Apr. 2013	**Mini-Conference on Graduate Research** Georgia Southern University, Statesboro, GA
4-8 Mar. 2013	**The 44th Southeastern Int. Conference on Combinatorics, Graph Theory and Computing** Florida Atlantic University, Boca Raton, FL
27-28 Oct. 2011	**The 26th Clemson Mini-Conference on Discrete Mathematics and Algorithms** Clemson University, Clemson, SC
24-25 Sep. 2011	**AMS Fall Southeastern Section Meeting #1073** Wake Forest University, Winston-Salem, NC
7-8 Oct. 2010	**The 25th Clemson Mini-Conference on Discrete Mathematics and Algorithms** Clemson University, Clemson, SC
5-8 Jan. 2009	**2009 Joint Mathematics Meetings** Marriott Wardman Park and Omni Shoreham, Washington, DC

References

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