

# SARAH LOEB

## EDUCATION

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- University of Illinois at Urbana-Champaign** Aug. 2011–present  
Department of Mathematics, expected Ph.D. graduation Aug. 2017  
Adviser: Douglas B. West
- Harvey Mudd College** Sept. 2007–May 2011  
B. S. in Mathematics, *cum laude*
- Budapest Semesters in Mathematics** Spring 2010  
Highest honors award for outstanding achievement

## PUBLICATIONS AND PREPRINTS

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6. Fractional and circular separation dimension of graphs (with D. B. West). *Submitted*. Also at *arXiv:1609.01612*.
5. Dynamic coloring parameters for graphs with given genus (with T. Mahoney, B. Reiniger, and J. Wise). *Under Revision*. Also at *arXiv:1511.03983*.
4. Asymptotically optimal neighbor sum distinguishing total colorings of graphs (with J. Przybyło and Y. Tang). *Discrete Mathematics* 340 (2017), 58–62. Also at *arXiv:1507.07573*.
3.  $I, F$ -Partitions of sparse graphs (with A. Brandt, M. Ferrara, M. Kumbhat, D. Stolee, and M. Yancey). *European Journal of Combinatorics* 57 (2016), 1–12. Also at *arXiv:1510.03381*.
2. Fool's Solitaire on joins and Cartesian products of graphs (with J. Wise). *Discrete Mathematics* 338 (2015), 66–71. Also at *arXiv:1402.7105*.
1. Three topics in online list coloring (with J. Carraher, T. Mahoney, G. J. Puleo, M.-T. Tsai, and D. B. West). *Journal of Combinatorics* 5 (2014), 115–130.

## TEACHING EXPERIENCE

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- Instructor** University of Illinois at Urbana–Champaign
- *A Mathematical World* Fall 2015, Spring 2015
- Full course responsibility for an accelerated 8-week topics course for non-majors
- Merit program** University of Illinois at Urbana–Champaign
- The Merit program consists of active learning based workshops that are associated with a lecture course. I created content for the each workshops and assigned a grade associated with the workshop.
- *Calculus I* Spring 2013, Fall 2013, Spring 2017
  - *Preparation for calculus* Fall 2016
  - *Calculus III* Fall 2014, Spring 2016
  - *Calculus II* Fall 2012, Spring 2014
- Teaching assistant** University of Illinois at Urbana–Champaign
- *Calculus II*, led active learning discussion sections Spring 2012
  - *Calculus I*, led traditional discussion sections Fall 2011
- \*Named to the *List of Teachers Ranked as Excellent by Their Students* S-2012, F-2014, S-2016

## Grader and tutor

Harvey Mudd College

- Tutor: *Graph Theory* (Spring 2011) and *Analysis II* (Fall 2011)
- Grader: *Graph Theory* (Spring 2011), *Analysis II* (Fall 2011), *Discrete Mathematics* (Fall 2010 and Fall 2009), *Linear Algebra II* (Spring 2009), *Differential Equations II* (Spring 2009), *Linear Algebra I* (Fall 2008), and *Differential Equations I* (Fall 2008)

## SERVICE

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### Association of Women in Mathematics, U. of Illinois at Urbana–Champaign chapter

- *Academic Committee Chair* Fall 2016–present
- *President* Fall 2015–Spring 2016
- *Vice President* Fall 2014–Spring 2015
- *Treasurer* Fall 2012–Spring 2014

### Formal Mentoring

- *Undergraduate Research*, Illinois Geometry Lab Spring 2017, Fall 2016  
Graduate mentor to undergraduate students directed by Ivan Contreras  
Received 2017 IGL Research Award for work in Fall 2016
- *Mentoring of Teaching Assistants* Spring 2014–Fall 2016  
Acted as a mentor to 11 Merit program teaching assistants; I observed 3–4 hours of class and offered feedback and assistance through the semester.

### Advising

- *Merit Program Advising* May–July 2016  
Held brief advising appointments with incoming freshmen interested in Merit program, and authorized students for registration to Merit sections.

### Teaching assistant training

- *Campus TA Training*, U. of Illinois, Urbana-Champaign Aug. 2016  
Watched practice teaching and ran discussion at micro-teaching sessions for new teaching assistants.
- *Mathematics Department TA Training*, U. of Illinois, Urbana-Champaign Aug. 2015, Aug. 2016  
In 2015, helped plan and run training sessions on grading and active learning. In 2016 helped run session on cultural diversity. Sessions were attended by all teaching assistants in the mathematics department.

### Committee member

- *Strategic Vision Core Implementation Committee*, Harvey Mudd College Oct. 2010–Dec. 2011  
One of two undergraduates on committee implementing college-wide change in curriculum.

### Referee

- *Referee* for *Discrete Mathematics*, *Electronic Journal of Combinatorics*, *European Journal of Combinatorics*, and *Rose-Hulman Undergraduate Mathematics Journal*
- *Reviewer* for AMS Mathematical Reviews

## PRESENTATIONS AND WORKSHOPS ATTENDED

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### Invited talks

- *The Discharging Method and Graph Coloring* Dec. 2016  
Math Department Seminar, Rose-Hulman Institute of Technology, Terre Haute, IN

- *The Discharging Method and Graph Coloring* Nov. 2016  
Harvey Mudd College, Claremont, CA
- *Fractional Separation Dimension* Oct. 2016  
AMS Fall Western Sectional Meeting, University of Denver, Denver, CO  
Special Session on Recent Advances in Structural and Extremal Graph Theory
- *I, F-partitions of sparse graphs* Jan. 2016  
Joint Mathematics Meetings, Seattle, WA  
Special Session on Research from the Rocky Mountain–Great Plains Workshop in Combinatorics
- *Fractional separation dimension* Oct. 2015  
Combinatorics Seminar, Iowa State University, Ames, IA
- *Asymptotically optimal neighbor sum distinguishing total colorings of graphs* Oct. 2015  
Combinatorics Seminar, Miami University, Oxford, OH
- *Asymptotically optimal neighbor sum distinguishing total colorings of graphs* Sept. 2015  
Combinatorics and its Applications, Miami University, Oxford, OH
- *Fool's Solitaire for joins and Cartesian products of graphs* Nov. 2013  
Combinatorics Seminar, Zhejiang Normal University, Jinhua, China

### Contributed talks

- *Circular Separation Dimension* Jan. 2017  
Joint Mathematics Meetings, Atlanta, GA
- *Fractional Separation Dimension* Oct. 2016  
Midwestern Conference on Combinatorics and Combinatorial Computing, Illinois State University, IL
- *Fractional Separation Dimension* March 2016  
Midwest Graph Theory Conference, Wright State University, Dayton, OH
- *3-Dynamic coloring planar and toroidal graphs* March 2015  
Graduate Student Conference in Combinatorics, University of Kentucky, Lexington, KY
- *Fool's Solitaire on Cartesian products of graphs* April 2014  
Graduate Student Conference in Combinatorics, Auburn University, Auburn, AL
- *Fool's Solitaire on graph joins* March 2014  
Midwest Graph Theory Conference, University of Detroit Mercy, Detroit, MI
- *Results in chromatic-paintability and the paintability of complete bipartite graphs* Sept. 2012  
Midwest Graph Theory Conference, Iowa State University, Ames, IA
- *Extending list colorings of planar graphs* March 2011  
Pacific Coast Undergraduate Math Conference, Loyola Marymount University, Los Angeles, CA
- *Permissible planar embeddings of ribbon graph blow-ups* Aug. 2011  
Young Mathematicians Conference, The Ohio State University, Columbus, OH

### Posters

- *Fractional Separation Dimension* Jan. 2017  
Joint Mathematics Meeting, Atlanta, GA  
Association for Women in Mathematics Poster Session
- *Fractional Separation Dimension* Aug. 2016  
Extremal Combinatorics at Illinois, Illinois Institute of Technology, Chicago, IL  
Graduate student poster session
- *Permissible planar embeddings of ribbon graph blow-ups* Jan. 2011  
Joint Mathematics Meeting, New Orleans, LA  
Undergraduate Poster Session, Received an Outstanding Poster Award

### Local seminar talks

- *Fractional Separation Dimension* Oct. 2016  
University of Illinois at Urbana–Champaign

- *I, F-partitions of sparse graphs* Nov. 2015
- *Fool's Solitaire for joins and Cartesian products of graphs* Feb. 2014

**Funded Workshop Attendance**

- *Graduate Research Workshop*, Denver, CO and Ames, IA July 2017, June 2015  
 Rocky Mountain–Great Plains Graduate Research Workshop in Combinatorics  
 Competitively selected to participate in workshop on open problems in combinatorics.  
 In 2015, selected to present a problem.
- *Mathematical Research Community*, Snowbird, UT June 2017  
 Beyond Planarity: Crossing Numbers of Graphs
- *Combinatorics Workshop*, Kalamazoo, MI and Notre Dame, IN April 2017, March 2015  
 Lake Michigan Workshop on Combinatorics and Graph Theory
- *Mentoring Workshop*, Norton, MA June 2016  
 CaMeW: Career Mentoring Workshop for Women, Wheaton College
- *Graduate Research Workshop*, Urbana, IL Summers 2011–2014  
 Research Experience for Graduate Students  
 Presented an open problem to group and worked in groups on open problems in combinatorics.