

# Gregory J. Clark

Research Fellow  
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Mathematical Research Interests: *Spectral Hypergraph Theory, Computational Algebra, k-planar Crossing Numbers, Additive Combinatorics, Graph Coloring.*

Interdisciplinary Research Interests: *Analyzing Networks, Trend Detection, Modeling Reputation.*

## Academic Employment

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**Research Fellow in Marketing and Reputation**, University of Oxford, UK. *2019 - 2022*

## Education

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**Ph.D. Mathematics**, University of South Carolina, Columbia, SC. *May 2019*  
*Dissertation Title:* On the Characteristic Polynomial of a Hypergraph.  
*Advisors:* Professor Joshua N. Cooper.

**B.S. Mathematics**, Westminster College, New Wilmington, PA. *May 2014*

**Budapest Semesters in Mathematics**, Budapest, Hungary. *Spring 2013*

**French Language and Culture Summer Immersion Program** Paris, France *Summer 2012*

## Research Publications

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9. G. J. Clark, J. Cooper, A Harary-Sachs Theorem for Hypergraphs. *Submitted*
8. G. J. Clark, F. Thomaz, A. Wiedemann, Designed to go dark: an examination of incentives for digital black markets to self-terminate. *Submitted*
7. G. J. Clark, J. Cooper, Adjacency Spectral Theory for Uniform Hypergraphs, *IMAGE (Bull. Lin. Alg. Soc.)*, **62** (2019), pp. 7-19.
6. G. J. Clark, J. Cooper, Leading Coefficients and the Multiplicity of Known Roots. <https://arxiv.org/abs/1806.05222> *Submitted, Summer 2018*
5. J. Asplund, E. Czabarka, G. Clark, et al., Using Block Designs in Crossing Number Bounds. To appear in *Journal of Combinatorial Designs*. *To appear*
4. G. J. Clark, J. Cooper, On the Adjacency Spectra of Hypertrees, *Elec. J. Comb.*, **25** (2018), no. 2, pp. 2-48.
3. G. J. Clark, G. Spencer, New Bounds on the Biplanar Crossing Number of Low-dimensional Hypercubes. *Bulletin of the Institute of Combinatorics and its Applications (BICA)* 83(2018), 52-60.
2. A. Bright, G. J. Clark, C. Dunn, K. Evitts, M. Hitchman, B. Keating, B. Whetter, Tiling Annular Regions with Skew and T-tetrominoes, *Involve, a Journal of Mathematics* 10-3 (2017), 505–521. DOI 10.2140/involve.2017.10.505.
1. G. J. Clark, Optimal Numbers and Solutions in the Euclidean Algorithm, *The Pentagon, A Mathematics Magazine for Students*, 73-01 (2013), 23-35.

## Teaching

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### Instructor of Record

*July 2015 – Present*

Department of Mathematics, University of South Carolina.

1. Math 115: Precalculus *Fall 2015*
2. Math 122: Business Calculus *Fall 2018, Spring 2018, Fall 2017*
3. Math 170: Finite Mathematics *Fall 2015, Spring 2016, Summer 2015*

### Graduate Student Mentor

*Fall 2016-Spring 2017*

#### NSF EAGER Grant for Innovative Research award ID #1725295

Participated in twenty hours of mentorship training which focused on pedagogical discourse. Conducted twelve classroom observations and post-observation discussions each semester. Hosted highly attended bimonthly mini-seminars with participants to discuss teaching concerns.

Department of Mathematics, University of South Carolina.

### Graduate Teaching Assistant

*Fall 2014-Spring 2015*

Department of Mathematics, University of South Carolina.

1. Math 141: Calculus 1 *Fall 2014, Spring 2015*

## Research Advisement

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Advisees have conducted independent research with support through

- University of South Carolina Summer Program for Research Interns
- Support for Minority Advancement in Research Training
- Magellan Scholars Program

Upon completion of the program, each advisee composed a poster and presented their work at local conferences.

1. Undergraduate
  - (a) Caleb Simmons, A Summary of Splitting Numbers for Integer Tiles *Summer 2016*
  - (b) Corey Stewart, A Summary of Splitting Numbers for Integer Tiles *Summer 2016*
  - (c) Eric Miller, Generalized Dinitz Conjecture *Fall 2015-Spring 2016*
2. High School
  - (a) Jacob Folks, A Summary of Splitting Numbers for Integer Tiles *Summer 2016*
  - (b) Seungmok Lee, A Summary of Splitting Numbers for Integer Tiles *Summer 2016*
  - (c) Sydney Miyasaki, A Summary of Splitting Numbers for Integer Tiles *Summer 2016*

## Grants, Activities, and Honors

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### SPARC Grant Recipient

*Summer 2017*

Sponsored by the Office of the Vice President for Research, the Support to Promote Advancement of Research and Creativity, or SPARC, Graduate Research Grant is a merit-based award designed to ignite research and creative excellence across all disciplines at USC.

### Preparing Future Faculty Certificate With Distinction in Teaching

*Spring 2019*

Successful PFF candidates have completed activities designed to prepare participants in the critical areas of faculty competence: teaching, research and service. This accomplishment is an indicator of the participant's initiative and a measure of experience toward becoming future faculty. Contact Dr. Sean Yee (yee@math.sc.edu) for additional information.

### Peer Reviewer for *Involve*, a Journal in Mathematics

*Fall 2017-Spring 2018*

### Outstanding Graduate Teaching Award

*Spring 2018*

### USC Combinatorics Seminar Organizer

*Fall 2016-Spring 2017*

### Graduate Peer Excellence Award

*Spring 2015*

## Invited Talks and Workshops Attended

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(Travel support denoted by asterisk.)

### 8. 2018 Annual Reputation Symposium\*

*Fall 2018*

*Distinguishing Between Reputation and Influence of Users in a Complex System*

Oxford University, Oxford, United Kingdom

### 7. NSF-CBMS Workshop on Additive Combinatorics\*

*Summer 2018*

University of South Carolina, Columbia, SC

### 6. Research Highlight\*

*Spring 2018*

*Designed to Fail: Determining Illicit Market Life Spans with Stochastic Calculus*

Oxford University, Oxford, United Kingdom

### 5. Practice for Coordinators of Large Undergraduate Courses on Campus

*Fall 2017*

*A Mentorship Model for Graduate Student Instructors in Large Undergraduate Courses*

University of South Carolina Center for Teaching Excellence, Columbia, SC

### 4. Mathematical Research Communities\*

*Summer 2017*

Beyond Planarity: Crossing Numbers of Graphs

Snowbird Resort, Snowbird, UT

### 3. Joint Mathematics Meeting\*

*Spring 2017*

*Graduate Student Instructor Mentorship Model: A professional development that trains experienced graduate students to pedagogically mentor novice mathematics graduate student instructors*

Hyatt Regency Atlanta and Marriott Atlanta Marquis, Atlanta, GA

### 2. AMS Sectional Meeting\*

*Fall 2016*

*The Splitting Number of an Integer Tile*

North Carolina State University, Raleigh, NC

### 1. Carolina Math Seminar

*Fall 2016*

*The Splitting Number of an Integer Tile*

Columbia College, Columbia, SC

## Conferences and Seminars Attended

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(Travel support denoted by asterisk.)

<b>Combinatorics Seminar</b> <i>On the Computation of the Characteristic Polynomial of a Hypergraph</i> University of South Carolina, Columbia	<i>Fall 2018</i>
<b>Discover USC: Three Minute Thesis Competition</b> <i>Modeling Dark Net Markets</i> University of South Carolina, Columbia	<i>Spring 2018</i>
<b>Combinatorics Seminar</b> <i>A Combinatorial Description for the Coefficients of the Characteristic Polynomial of a Hypergraph</i> University of South Carolina, Columbia	<i>Spring 2018</i>
<b>Conference on Research in Undergraduate Mathematics Education*</b> <i>Mentor Professional Development for Mathematics Graduate Student Instructors</i> Kona Kai, San Diego, CA	<i>Spring 2017</i>
<b>Triangle Lecture Series*</b> University of North Carolina, Greensboro, NC.	<i>Spring 2016</i>
<b>Combinatorics Seminar</b> <i>On de Bruijn Sequences with Varying Combs</i> University of South Carolina, Columbia, SC	<i>Fall 2015</i>
<b>Atlanta Lecture Series*</b> Georgia Tech, Atlanta, GA.	<i>Fall 2015</i>
<b>Graduate Student Combinatorics Conference*</b> <i>A Compact Look at Codensity</i> University of Kentucky, Lexington, KY	<i>Spring 2015</i>
<b>Service Activities</b> <hr/>	
<b>USC Center for Teaching Excellence Symposium Moderator</b>	<i>Spring 2016, 2017</i>
<b>Discover USC Poster Session Judge</b>	<i>Spring 2016, 2017</i>
<b>High School Mathematics Competition Volunteer</b>	<i>Fall 2017</i>
<b>Completed Safe Space Training</b>	<i>Spring 2015</i>