

# George Brooks

## Curriculum Vitae

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### Research Interests

Extremal and probabilistic combinatorics, spectral graph theory, and Ricci curvature of graphs with applications to data science.

### Education

- 2020– **Ph.D. Mathematics**, *University of South Carolina*, Columbia, SC  
Present Advisor: Linyuan Lu
- 2012–2018 **B.S. Mathematics**, *Saginaw Valley State University*, University Center, MI  
Minor in Chemistry

### Academic Employment

- 2020– **Graduate Instructional/Teaching Assistant**  
Present Department of Mathematics, University of South Carolina, Columbia, SC
- 2018–2020 **Adjunct Instructor & Tutoring Center**  
Science & Math Division, Northwestern Michigan College, Traverse City, MI

### Teaching Experience

#### University of South Carolina

- 2021– **Instructor of Record**, *Department of Mathematics*  
Present
  - MATH 115: Precalculus Mathematics (Fall 2023)
  - MATH 174: Discrete Mathematics for Computer Science (Spring 2023)
  - MATH 174: Discrete Mathematics for Computer Science (Fall 2022)
  - MATH 344L/544L: Applied Linear Algebra Laboratory (Spring 2022)
  - MATH 115: Precalculus Mathematics (Fall 2021)
  - MATH 122: Calculus for BA and Social Sciences (Summer 2021)
- 2020– **Teaching Assistant**, *Department of Mathematics*  
Present
  - MATH 142: Calculus II - Honors (Fall 2023)
  - MATH 141: Calculus I - Honors (Fall 2021)
  - MATH 142: Calculus II (Spring 2021)
  - MATH 141: Calculus I (Fall 2020)
- #### Northwestern Michigan College
- 2019–2020 **Adjunct Instructor**, *Science & Math Division*
  - MTH 111: Intermediate Algebra (Spring 2020)
  - MTH 08: Pre-Algebra (Spring 2020)
  - MTH 08: Pre-Algebra (Fall 2019)

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## Workshops

- May 2023 **AMS Mathematical Research Communities**  
Beaver Hollow Conference Center, Java Center, NY
- 2022– **Summer School on Mathematical Foundations of Data Science**  
Present Department of Mathematics, University of South Carolina, Columbia, SC

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## Preprints

4. G. Brooks, F. Osaye, A. Schenfisch, and Z. Wang, **Outerplanar graphs with positive Lin-Lu-Yau curvature.** [arXiv:2403.04110](#) (2024)
3. G. Brooks and W. Linz, **Hypergraph Turán problems in  $\ell_2$ -norm, the Kleitman-West problem and Erdős-Ko-Rado.** [arXiv:2310.09379](#) (2024)
2. G. Brooks, M. Gu, J. Hyatt, W. Linz, and L. Lu, **On the Maximum Second Eigenvalue of Outerplanar Graphs.** [arXiv:2309.08548](#) (2023)

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## Publications

1. G. Brooks, G. Johns, and C. St. Clair, **Induced Closed Modular Colorings of Graphs.** *Proceedings of Midstates Conference for Undergraduate Research in Computer Science and Mathematics.* (2017)

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## Invited Talks

- Feb 2024 **Discrete Mathematics Seminar**  
*Outerplanar Graphs with Positive Lin-Lu-Yau Curvature*  
University of South Carolina, Columbia, SC
- Jan 2024 **AMS Special Session on Ricci Curvatures of Graph and Applications to Data Science**  
*Outerplanar Graphs with Positive Lin-Lu-Yau Curvature*  
Joint Mathematics Meeting, San Francisco, CA
- Nov 2023 **Graduate Colloquium**  
*On the Maximum Second Eigenvalue of Outerplanar Graphs*  
University of South Carolina, Columbia, SC
- Mar 2023 **Graduate Mini-Conference in Discrete Mathematics**  
*Introduction to Flag Algebras*  
University of South Carolina, Columbia, SC
- Oct 2022 **Graduate Colloquium**  
*Introduction to Flag Algebras*  
University of South Carolina, Columbia, SC

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## Service

### University of South Carolina

- 2024– **Math Learning Center Coordinator**  
Present Facilitating LMS integration for MAP and Gateway testing.
- 2023– **Graduate Student Instructor Peer Mentor Program**  
Present Mentoring graduate student instructors of record.

2022– **REU Coordinator**

Present Supervising, teaching, and research during summer REU.

2022– **Discrete Reading Seminar - Organizer**

Present Topics have included: spectral graph theory, hypergraph container method, etc.

2021–2022 **Graduate Advisory Council - Student Representative**

Represented graduate students in departmental matters

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## Volunteer Work

2023–2024 Leaphart Elementary Math Outreach

2023–2024 UofSC Annual High School Math Contest - Activity Organizer

Nov 2021 South Carolina Council of Teachers of Mathematics Conference

Oct 2021 Oktoberbest 2021: A Symposium on Teaching