

Email: jnie47@gatech.edu

**Research interests** My research interests lie mainly in extremal combinatorics and probabilistic combinatorics, but I keep my brain open for any interesting math problems.

**Positions**

|                                      |                                 |
|--------------------------------------|---------------------------------|
| <b>Visiting Assistant Professor,</b> | Georgia Institute of Technology |
| Supervisor: Xiaoyu He                | 2024 August – present           |

|                                 |   |
|---------------------------------|---|
| <b>Postdoctoral Researcher,</b> | Shanghai Center for Mathematical Sciences |
| Supervisor: Hehui Wu            | 2022 September – 2024 July                |

|                             |  |
|-----------------------------|--|
| <b>Short-term postdoc,</b>  | Max Planck Institute for Mathematics in the Sciences |
| Supervisor: Raffaella Mulas | 2022 May-August                                      |

**Education**

|  |             |
|--|-------------|
| <b>Ph.D. in Mathematics,</b> University of California, San Diego | 2016 – 2022 |
| Advisor: Jacques Verstraëte. GPA: 4.00/4.00                      |             |

|   |             |
|---|-------------|
| <b>B.S. in Mathematics,</b> Nankai University | 2012 – 2016 |
| GPA: 90.41/100                                |             |

|  |           |
|--|-----------|
| <b>Exchange Semester,</b> University of California, Berkeley | 2014 Fall |
| GPA: 4.00/4.00   |           |

**Preprints**

- 19. On tight tree-complete hypergraph Ramsey numbers**  
Submitted. [arxiv](#).
- 18. Random Turán Problems for  $K_{s,t}$  Expansions (With S. Spiro)**  
Submitted. [arxiv](#).
- 17. On the Matching Problem in Random Hypergraphs (With P. Frankl and J. Wang)**  
Submitted. [arxiv](#).
- 16. On odd covers of cliques and disjoint unions. (with C. Buchanan, A. Clifton, E. Culver, P. Frankl, K. Ozeki, P. Rombach, and M. Yin)**  
Submitted. [arxiv](#).
- 15. Random Turán Problems for Hypergraph Expansions. (With S. Spiro)**  
Submitted. [arxiv](#).
- 14. Sidorenko Hypergraphs and Random Turán Numbers. (With S. Spiro)**

Submitted. [arxiv](#).

**13. Random Turán and counting results for general position sets over finite fields. (with Y. Chen, X. Liu, and J. Zeng)**

Submitted. [arxiv](#).

**12. Random Turán theorem for expansions of spanning subgraphs of tight trees.**

Submitted. [arxiv](#).

## Publications

**11. Off-diagonal Ramsey number for slowly growing hypergraphs (with S. Mattheus, D. Mubayi and J. Verstraëte)**

To appear on *Random Structures & Algorithms*. [arxiv](#).

**10. Turán theorems for even cycles in random hypergraph.**

*Journal of Combinatorial Theory, Series B* 167 (2024): 23–54. [arxiv](#).

**9. On asymptotic local Turán problems. (with P. Frankl)**

*The Moscow Journal of Combinatorics and Number Theory*, 2023, 12(4): 273–286. [arxiv](#).

**8. On asymptotic packing of convex geometric and ordered graphs. (with E. Surya, and J. Zeng)**

*Journal of Graph Theory* (2023), 1–15. [arxiv](#).

**7. Odd Covers of Graphs. (with C. Buchanan, A. Clifton, E. Culver, J. O’Neill, P. Rombach, and M. Yin)**

*Journal of Graph Theory* (2023), 104: 420–439. [arxiv](#).

**6. On Turán numbers for disconnected hypergraphs. (with R. Mulas)**

*Acta Mathematica Hungarica* 170, 168–182 (2023). [arxiv](#).

**5. On Asymptotic Packing of Geometric Graphs. (with D. Cranston, J. Verstraëte, and A. Wesolek)**

*Discrete Applied Mathematics* 322 (2022): 142–152. [arxiv](#).

**4. Maximal independent sets in clique-free graphs. (with X. He, and S. Spiro)**

*European Journal of Combinatorics* 106 (2022): 103575. [arxiv](#).

**3. Ramsey Numbers for Non-trivial Berge Cycles. (with J. Verstraëte)**

*SIAM Journal on Discrete Mathematics* 36.1 (2022): 103–113. [arxiv](#).

**2. Triangle-free Subgraphs of Hypergraphs. (with S. Spiro, and J. Verstraëte)**

*Graphs and Combinatorics 37 (2021): 2555-2570. [arxiv](#).*

**1. Randomized greedy algorithm for independent sets in regular uniform hypergraphs with large girth. (with J. Verstraëte)**

*Random Structures & Algorithms 59.1 (2021): 79-95. [arxiv](#).*

Teaching

**As Instructor**

**at Georgia Institute of Technology:**

3012 - Applied Combinatorics Fall 2024

**at Fudan University:**

Graph Theory Fall 2023

**at UCSD**

MATH 20C - Calculus&Analyt Geom/Sci&Engnr Summer I 2021

**As Teaching Assistant at UCSD**

MATH 154 - Discrete Math & Graph Theory Winter 2022

MATH 154 - Discrete Math & Graph Theory Winter 2021

MATH 154 - Discrete Math & Graph Theory Fall 2020

MATH 20E - Vector Calculus Summer II 2020

MATH 154 - Discrete Math & Graph Theory Spring 2020

MATH 154 - Discrete Math & Graph Theory Winter 2020

MATH 170A - Intro Numerical Analys/Linear Fall 2019

MATH 220C - Complex Analysis Spring 2019

MATH 18 - Linear Algebra Spring 2019

MATH 170B - Intro/Numerical Analy/Approxim Winter 2019

MATH 170A - Intro Numerical Analys/Linear Fall 2018

MATH 142A - Introduction to Analysis I Summer I 2018

MATH 184A - Combinatorics Spring 2018

MATH 184A - Combinatorics Winter 2018

MATH 184A - Combinatorics Fall 2017

MATH 20B - Calculus/Science & Engineering Winter 2017

MATH 20A - Calculus/Science & Engineering Fall 2016

Service

Served as referee for the following journals:

Journal of Combinatorial Theory Series B, Combinatorica, Random Structures & Algorithms, SIAM Journal of Discrete Mathematics, Journal of Graph Theory, European Journal of combinatorics, Discrete Applied Mathematics, Australasian Journal of Combinatorics, Journal of Combinatorial Optimization, Discrete Mathematics.