

Brendan Nagle Curriculum Vita (2009)

Contact

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Education

Ph.D. (Mathematics), Emory University, 1999

Thesis: *Regularity Properties for Triple Systems*

Advisor: Vojtěch Rödl, Samuel Candler Dobbs Professor of Mathematics

M.S. (Mathematics), Emory University, 1999

B.S. with High Honors (Mathematics, double-major Philosophy), Emory University, 1994

Employment

Assistant Professor, 2006–present, Department of Mathematics and Statistics, University of South Florida

Assistant Professor, 2002–2006, Department of Mathematics and Statistics, University of Nevada, Reno

Postdoctoral Fellow, 1999–2002, School of Mathematics, Georgia Institute of Technology

Teaching Assistant, 1994–1999, Department of Mathematics and Computer Science, Emory University

Summer Instructor, 1999, Mathematics Department, Agnes Scott College

Grants

NSF grant DMS 0639839, Algebra, Number Theory and Combinatorics: “*Arithmetic Progressions and the Hypergraph Regularity Method*”, 2005–2009, PI

NSF grant INT 0072064, U.S.–Brazil Cooperative Research: “*Problems on Random Graphs (Structures) and Set Systems*”, 2000–2003, co-PI

PROMiSE (Partnership to Rejuvenate and Optimize Mathematics and Science Education in Florida), Florida Department of Education, 2009, Grant Partner

ACE (Achievement through Content Expertise), Hillsborough County and Florida Department of Education, 2007, Grant Partner

Papers (published or accepted)

1. *On computing the frequencies of induced subhypergraphs*, SIAM J. Discrete Math, to appear.
2. *On random sampling in uniform hypergraphs*, Random Structures Algorithms, to appear (with A. Czygrinow)
3. *Weak regularity and linear hypergraphs*, J. Combin. Theory Ser. B, to appear (with Y. Kohayakawa, V. Rödl and M. Schacht)
4. *Hereditary properties of hypergraphs*, J. Combin. Theory Ser. B **99** (2009), 460–473 (with R. Dotson)
5. *Hypergraph regularity and quasi-randomness*, In: Clair Mathieu (editor): Proceedings of the Twentieth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 09), pp. 227–245. ACM Press (with A. Poerschke, V. Rödl and M. Schacht)
6. *Note on the 3-graph Counting Lemma*, Discrete Math. **308** (2008), 4501–4517 (with V. Rödl and M. Schacht)

7. *On the Ramsey number of sparse 3-graphs*, Graphs Combin. **24** (2008) no. 3, 205–228 (with S. Olsen, V. Rödl and M. Schacht)
8. *An algorithmic version of hypergraph regularity*, SIAM J. Comput. **37** (2008), no. 6, 1728–1776 (with P. Haxell and V. Rödl)
9. *Extremal hypergraph problems and the regularity method*, in M. Klazar, J. Kratochvíl, M. Loeb, J. Matoušek, R. Thomas, P. Valtr (eds): Topics in Discrete Mathematics **26** (2006), *Algorithms Combin.*, 247–278, Springer, Berlin (with V. Rödl and M. Schacht)
10. *The counting lemma for regular k -uniform hypergraphs*, Random Structures Algorithms **28** (2006), no. 2, 113–179 (with V. Rödl and M. Schacht)
11. *The hypergraph regularity method and its applications*, Proceedings of the National Academy of Science **102** (2005), no. 23, 8109–8113 (with V. Rödl, J. Skokan, M. Schacht and Y. Kohayakawa)
12. *An algorithmic version of the Hypergraph Regularity Method* [Extended Abstract], 46th Annual IEEE Symposium on Foundations of Computer Science (FOCS'05), 2005, 439–448 (with P. Haxell and V. Rödl)
13. *Bounding the strong chromatic index of dense random graphs*, Discrete Math. **281** (2004), no. 1–3, 129–136 (with A. Czygrinow)
14. *Strong edge colorings of uniform graphs*, Discrete Math. **286** (2004), no. 3, 219–223 (with A. Czygrinow)
15. *Matrix-free proof of a regularity characterization*, Electron. J. Combin. **10** (2003), Research Paper 39, 11 pp. (electronic) (with A. Czygrinow)
16. *Regularity properties for triple systems*, Random Structures Algorithms **23** (2003), no. 3, 264–332 (with V. Rödl)
17. *Hereditary properties of triple systems*, Combin. Probab. Comput. **12** (2003), 248–310 (with Y. Kohayakawa and V. Rödl)
18. *Efficient testing of hypergraphs*, ICALP 2002, 29th International Colloquium on Automata, Languages and Programming, (Málaga, Spain), July 2002, Lecture Notes in Computer Science 2286, Springer, Berlin (2002), 278–293 (with Y. Kohayakawa and V. Rödl)
19. *On characterizing hypergraph regularity*, Random Structures Algorithms **21** (2002), no. 3–4, 293–335 (with Y. Dementieva, P. Haxell and V. Rödl)
20. *Fractional packings in dense 3-uniform hypergraphs*, Random Structures Algorithms **22** (2003), no. 3, 248–310 (with P. Haxell and V. Rödl)
21. *A note on codegree problems for hypergraphs*, Bull. Inst. Combin. Appl. **32** (2001), 63–69 (with A. Czygrinow)
22. *The asymptotic number of triple systems not containing a fixed one*, Discrete Math. **235** (2001), 271–290. (with V. Rödl)
23. *Turán related problems for hypergraphs*, Congr. Numer. **136** (1999), 119–127

Students

1. PhD

- (a) Jill Lusk - University of South Florida, in progress.
- (b) Annika Poerschke (codirected with V. Rödl), Emory University, 2008.
Thesis: *On algorithmic hypergraph regularity*

2. Masters

- (a) Shoaib Khan, University of South Florida, 2009.
Thesis: *On a hypergraph regularity method for linear hypergraphs*
- (b) Sayaka Olson, University of Nevada, Reno, 2008.

Thesis: *Hypergraphs with small Ramsey numbers*

(c) Ryan Dotson, University of Nevada, Reno, 2005.

Thesis: *An application of the hypergraph regularity method*

3. Undergraduate

(a) Sayaka Olson, University of Nevada, Reno, 2006.

NSF-EPSCOR research project: *Hypergraphs with small Ramsey numbers*
project partially supported by NSF award EPS 0132556

(b) Steve Laffeur, University of Nevada, Reno, 2006.

McNair Fellow Thesis: *The probabilistic method in combinatorics*
project partially supported by an undergraduate McNair Fellowship

Courses Taught

1. University of South Florida

UNDERGRADUATE:

Combinatorics and Graph Theory (MAT 4930)
Elementary Abstract Algebra (MAS 4301)
Linear Algebra (MAS 3105)
Calculus 1 (MAC 2311)

GRADUATE:

Combinatorics I (MAD 6206)
Combinatorics II (MAD 6207)
Combinatorics and Graph Theory (MAT 5932)
Directed Research (MAD 6911)

2. University of Nevada, Reno

UNDERGRADUATE:

Combinatorics and Graph Theory (Math 485)
Probability Theory (Math 461)
Topics in Algebra (Math 439)
Probability and Statistics (Math 352)
Linear Algebra (Math 330)
Differential Equations (Math 285)
Multivariable Calculus (Math 283)
Business Calculus (Math 183)
College Algebra (Math 124)
Independent Study (Math 499)

GRADUATE:

Topics in Algebra (Math 773)
Combinatorics and Graph Theory (Math 685)
Probability Theory (Math 661)
Topics in Algebra (Math 639)
Thesis (Math 797)

3. **Georgia Institute of Technology** Combinatorial Analysis (Math 4032), Probability and Statistics (Math 3052), Applied Combinatorics (Math 3012)
4. **Emory University** Business Calculus (Math 119), Calculus II (Math 112), Calculus I (Math 111)
5. **Agnes Scott College** Functions and Modeling (Precalculus) (Math 117)

Teaching recognition

Faculty Mentor (Spring, 2006), selected by Lee Bolling (College of Science–Mathematics), *Dean's Senior Scholars* (UNR)

Finalist (Spring, 2005): *LeMay Excellence in Teaching Award* (UNR)

Recipient (1999): *Trevor Evans Award for Excellence in Teaching* (Emory) \$500

Inclusion: *Who's Who among Teachers in American Colleges and Universities* (2003), *Who's Who among Graduate Students in American Colleges and Universities* (1999).

Select Presentations

1. Hypergraph regularity and quasirandomness, *Twentieth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 09)*, Jan 4–6 (2009), New York Marriott Downtown, New York, NY

2. On an extremal hypergraph problem concerning forbidden families, *Integers Conference 2007*, Oct 24–27 (2007), State University of West Georgia, Carrollton, GA
3. Small subsystems of uniformly distributed 3-graphs, *12th International Conference on RANDOM STRUCTURES AND ALGORITHMS*, Aug. 1–5 (2005), Poznan, Poland
4. Extremal hypergraph problems and arithmetic progressions, *Recent Trends in Additive Combinatorics*, Sept. 9–12 (2004), American Institute of Mathematics, Palo Alto, CA
5. Characterizing hypergraph quasi-randomness, *Regularity for hypergraphs* (Focused Research Group: 03frg004) May 10–2 (2003), Banff International Research Station, Alberta, Canada
6. Hypergraph regularity and problems on the integers, *Integers Conference 2003* (in Honor of Tom Brown on the occasion of his 65th birthday), Oct. 31–Nov. 2 (2003), State University of West Georgia, Carrollton, GA
7. Efficient testing of hypergraphs, *Automata, Languages and Programming, 29th International Colloquium (ICALP 2002)*, July 8–13, Málaga, Spain
8. Hypergraph regularity, algorithms and applications, *Workshop on Combinatorics, Random Structures and Algorithms*, March 12–13 (2002), Instituto Nacional de Matemática Pura e Aplicada, Rio de Janeiro, Brasil
9. Counting small cliques in hypergraphs, *Conference on Hypergraphs (Gyula O.H. Katona is 60)*, June 7–9 (2001), Rényi Institute, Budapest, Hungary