

Brendan Nagle Curriculum Vita (2010)

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

Associate Professor, 2010–present, Department of Mathematics and Statistics, University of South Florida

Assistant Professor, 2006–2010, 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

Grants

NSF grant DMS 1001781, Combinatorics: *Hypergraph regularity algorithms, equivalent conditions and applications*, 2010–2013, PI

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, 2008–2010, Grant Partner

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

Papers

1. *On random sampling in uniform hypergraphs*, Random Structures Algorithms, to appear (with A. Czygrinow)
2. *On computing the frequencies of induced subhypergraphs*, SIAM J. Discrete Math. **24**, no. 1, 322–329 (2010)
3. *Weak regularity and linear hypergraphs*, J. Combin. Theory Ser. B **100** (2010), no. 2, 151–160 (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) Greg Churchill, University of South Florida, in progress.

(b) Michelle Krause, University of South Florida, 2010.

Thesis: *An introduction to the linear algebra method in combinatorics*

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

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

(d) Steve Lafleur, 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

Combinatorics I (MAD 6206)

Combinatorics II (MAD 6207)

Graph Theory (MAD 5305)

Combinatorics and Graph Theory (MAT 5932/4930)

Elementary Abstract Algebra (MAS 4301)

Linear Algebra (MAS 3105)

Calculus I (MAC 2311)

2. University of Nevada, Reno

Topics in Algebra (Math 773/639/439)

Combinatorics and Graph Theory (Math 685/485)

Probability Theory (Math 661/461)

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)

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)