

## Brendan Nagle Curriculum Vita (2016)

### 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 (majors: Mathematics, 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*, 2010–2016 (September), 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

### Administrative positions

Director of Mathematics Graduate Admissions, 2011–present

### Publications

35. *On extending Hansel's theorem to hypergraphs*, submitted (with G. Churchill)
34. *An algorithmic hypergraph regularity lemma*, submitted (with V. Rödl and M. Schacht)
33. *Constructive packings of triple systems*, SIAM J. Discrete Math, recommended for publication
32. *An extremal problem for finite lattices*, Theory and Applications of Graphs **3** (2016), no. 1, 6pp. (with J. Goldwasser and A. Saez)
31. *An algorithmic hypergraph regularity lemma* [Extended Abstract], In: Robert Krauthgamer (editor): Proceedings of the Twenty-Seventh Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2015), pp. 1765–1773. ACM Press (with V. Rödl and M. Schacht)
30. *Asymptotics of the extremal exceedance set statistic*, European J. Combinatorics **46** (2015), 75–88 (with R. Ferraz de Andrade and E. Lundberg)

29. *Tiling 3-uniform hypergraphs with  $K_4^{(3)} - 2e$* , Journal of Graph Theory **75** (2014) no. 4, 124–136. (with A. Czygrinow and L. DeBiasio)
28. *Constructive packings by linear hypergraphs*, Combin. Probab. Comput. **22** (2013) no. 6, 829–858 (with J. Dizona)
27. *Generalized pattern frequency in large permutations*, Electron. J. Combin. **20** (2013), no. 1, #P28 (with J. Cooper and E. Lundberg)
26. *Tree-minimal graphs are almost regular*, Journal of Combinatorics **3** (2012) no. 1, 49–62 (with D. Dellamonica, P. Haxell, T. Łuczak, D. Mubayi, Y. Person, V. Rödl, M. Schacht)
25. *On even-degree subgraphs of linear hypergraphs*, Combin. Probab. Comput. **21** (2012), 113–127 (with D. Dellamonica, P. Haxell, T. Łuczak, D. Mubayi, Y. Person, V. Rödl, M. Schacht, J. Verstraete)
24. *A hypergraph regularity method for linear hypergraphs, with applications*, LAP Lambert Academic Publishing (2011), 1–56 (with S. Khan)
23. *On random sampling in uniform hypergraphs*, Random Structures Algorithms **38** (2011), 422–440 (with A. Czygrinow)
22. *On computing the frequencies of induced subhypergraphs*, SIAM J. Discrete Math. **24** (2010), no. 1, 322–329
21. *Weak regularity and linear hypergraphs*, J. Combin. Theory Ser. B **100** (2010), no. 2, 151–160 (with Y. Kohayakawa, V. Rödl and M. Schacht)
20. *Hereditary properties of hypergraphs*, J. Combin. Theory Ser. B **99** (2009), 460–473 (with R. Dotson)
19. *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)
18. *Note on the 3-graph Counting Lemma*, Discrete Math. **308** (2008), 4501–4517 (with V. Rödl and M. Schacht)
17. *On the Ramsey number of sparse 3-graphs*, Graphs Combin. **24** (2008) no. 3, 205–228 (with S. Olsen, V. Rödl and M. Schacht)
16. *An algorithmic version of hypergraph regularity*, SIAM J. Comput. **37** (2008), no. 6, 1728–1776 (with P. Haxell and V. Rödl)
15. *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)
14. *The counting lemma for regular  $k$ -uniform hypergraphs*, Random Structures Algorithms **28** (2006), no. 2, 113–179 (with V. Rödl and M. Schacht)
13. *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)
11. *Bounding the strong chromatic index of dense random graphs*, Discrete Math. **281** (2004), no. 1–3, 129–136 (with A. Czygrinow)
10. *Strong edge colorings of uniform graphs*, Discrete Math. **286** (2004), no. 3, 219–223 (with A. Czygrinow)
9. *Matrix-free proof of a regularity characterization*, Electron. J. Combin. **10** (2003), Research Paper 39, 11 pp. (electronic) (with A. Czygrinow)
8. *Regularity properties for triple systems*, Random Structures Algorithms **23** (2003), no. 3, 264–332 (with V. Rödl)

7. *Hereditary properties of triple systems*, *Combin. Probab. Comput.* **12** (2003), 248–310 (with Y. Kohayakawa and V. Rödl)
6. *Integer and fractional packings in dense 3-uniform hypergraphs*, *Random Structures Algorithms* **22** (2003), no. 3, 248–310 (with P. Haxell and V. Rödl)
5. *Efficient testing of hypergraphs*, ICALP 2002, 29<sup>th</sup> 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)
4. *On characterizing hypergraph regularity*, *Random Structures Algorithms* **21** (2002), no. 3–4, 293–335 (with Y. Dementieva, P. Haxell and V. Rödl)
3. *A note on codegree problems for hypergraphs*, *Bull. Inst. Combin. Appl.* **32** (2001), 63–69 (with A. Czygrinow)
2. *The asymptotic number of triple systems not containing a fixed one*, *Discrete Math.* **235** (2001), 271–290. (with V. Rödl)
1. *Turán related problems for hypergraphs*, *Congr. Numer.* **136** (1999), 119–127

## Manuscripts

- *Constructive packings of hypergraphs*, in progress
- *The regularity method for hypergraphs*, nearly complete (with V. Rödl and M. Schacht)
- *An exact Hansel theorem for hypergraphs*, nearly complete (with G. Churchill)
- *Constructive problems for 3-uniform hypergraphs*, in progress (with G. Churchill and J. Theado)
- *An optimal algorithm for  $\varepsilon$ -regular partitions of 3-graphs*, in progress (with J. Theado)
- *Equivalent conditions of hypergraph regularity*, in progress (with V. Rödl and M. Schacht)
- *Extremal problems for  $d$ -dimensional grids*, in progress (with J. Goldwasser and A. Saez)

## Students

### 1. PhD

- (a) John Theado - University of South Florida, in progress.
- (b) Gregory Churchill - University of South Florida, in progress.
- (c) Jill Dizona - University of South Florida, 2012.  
Thesis: *Constructive packings by linear hypergraphs*
- (d) 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: *Hereditary properties of hypergraphs*

## Courses Taught

### 1. University of South Florida (2006–present)

Combinatorics I (MAD 6206)	Combinatorics and Graph Theory (MAT 4930)
Combinatorics II (MAD 6207)	Elementary Abstract Algebra (MAS 4301)
Graph Theory (MAD 5305)	Bridge to Abstract Mathematics (MGF 3301)
Introduction to Combinatorics (MAD 4203)	Linear Algebra (MAS 3105)
Introduction to Graph Theory (MAD 4301)	Calculus 1 (MAC 2301)

**2. University of Nevada, Reno (2002–2006)**

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 (1999–2002)**

Combinatorial Analysis (Math 4032)

Probability and Statistics (Math 3052)

Applied Combinatorics (Math 3012)

**4. Emory University (1995–1999)**

Business Calculus (Math 119)

Calculus II (Math 112)

Calculus I (Math 111)