GIORGIS PETRIDIS

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RESEARCH INTERESTS

Arithmetic Combinatorics: Cardinality questions in set addition, sum-product phenomena in finite fields.

Analysis: Exponential sums.

Probabilistic Combinatorics: Random regular graphs.

EMPLOYMENT

Assistant Professor, The University of Georgia in Athens, 2016 - present.

Visiting Assistant Professor, University of Rochester, 2012 - 2016.

EDUCATION

Doctor of Philosophy under the supervision of W.T. Gowers, University of Cambridge, 2002 - 2011. Thesis title: *Plünnecke's Inequality and the Cardinality of Sumsets*.

Certificate of Advanced Studies in Mathematics (equivalent to MMath), St John's College, University of Cambridge, 2001 - 2002. Essay title: *Arithmetic Progressions in Sumsets*.

BA (Hons) in Mathematics, St John's College, University of Cambridge, 1998 - 2001.

GRANTS AND SCHOLARSHIPS

NSF DMS Award 1500984, 2015 - 2018.

AMS-Simons Travel Grant, 2013 - 2015.

A.S. Onassis Foundation Doctoral Scholarship, 2002 - 2005.

St John's College, University of Cambridge, Doctoral Scholarship, 2002 - 2005.

Engineering and Physical Sciences Research Council, Doctoral Scholarship, 2002 - 2005.

St John's College, University of Cambridge, Wright Prize from, 2002.

LIST OF PUBLICATIONS

[1] B. Murphy, G. Petridis, O. Roche-Newton, M. Rudnev and I.D. Shkredov, *New results on sum-product type growth over fields*, Submitted, arXiv:1702.01003, 2017.

[2] B. Murphy and G. Petridis, *A second wave of expanders over finite fields*, To appear in Combinatorial and Additive Number Theory (CANT 2015 and 2016), arXiv:1701.01635, 2017.

[3] G. Petridis, *Pinned algebraic distances determined by Cartesian products in* $\mathbf{F}_p^2$, To appear in Proc. Amer. Math. Soc., arXiv:1610.03172, 2016.

[4] G. Petridis, *Products of differences in prime order finite fields*, In progress, arXiv:1602.02142, 2016.

[5] G. Petridis, *On the number of dot products determined by a large set and one of its translates in finite fields*, Submitted, arXiv:1510.07918, 2015.

[6] G. Petridis and I.E. Shparlinski, *Bounds on trilinear and quadrilinear exponential sums*, To appear in J. Anal. Math., arXiv:1604.08469, 2016.

[7] C. Aten et all, *Tiling sets and spectral sets over finite fields*, To appear in J. Funct. Anal., arXiv:1509.01090, 2015.

[8] B. Murphy and G. Petridis, *A point-line incidence identity in finite fields, and applications*, Mosc. J. Comb. Number Theory 6 (1), 64–95, 2016.

[9] B. Murphy, E. Palsson and G. Petridis, *The cardinality of sumsets: different summands*, Acta Arith. 167 (4), 375–395, 2015.

[10] G. Petridis, *The Plünnecke–Ruzsa inequality: an overview*, in: Combinatorial and Additive Number Theory (CANT 2011 and 2012), 229–241, 2014.

[11] G. Petridis, *Upper bounds on the cardinality of higher sumsets*, Acta Arith. 158 (4), 299–319, 2013.

[12] G. Petridis, *The* L^1*-norm of exponential sums in* $\mathbb{Z}^d$, Math. Proc. Cambridge Philos. Soc. 154 (3), 381–391, 2013.

[13] G. Perarnau and G. Petridis, *Matchings in random biregular bipartite graphs*, Electron. J. Combin. 20 (1), P60, 2013.

[14] G. Petridis, *New proofs of Plünnecke-type estimates for product sets in groups*, Combinatorica 32 (6), 721–733, 2012.

[15] G. Petridis, *Plünnecke's inequality*, Combin. Probab. Comput. 20 (6), 921–938, 2011.

INVITED SPEAKER FOR WORKSHOPS

Week-long Block Course in Additive Combinatorics, Freie Universität Berlin, Germany, October 2014.

Series of four talks at the New York Number Theory Seminar, CUNY Graduate Center, NY, USA, May 2011.

WORKSHOP PARTICIPATION

Additive and Analytic Combinatorics Workshop, IMA, Minneapolis, MN, USA, 29 Sep - 3 Oct 2014.

The Kakeya Problem, Restriction Problem, and Sum-product Theory Workshop, IPAM, Los Angeles, CA, USA, 5 - 9 May 2014.

SELECTED INVITED TALKS AND VISITS

19th Atlanta Lecture Series in Graph Theory and Combinatorics, Georgia State University, April 2017. Universidad Autónoma de Madrid, Seminar, Madrid, Spain, December 2016.

Georgia Institute of Technology, Seminar, Atlanta, GA, November 2016.

Missouri State University, Colloquium, Springfield, MO, March 2016.

Kansas State University, Colloquium, Manhattan, KS, USA, February 2016.

University of Georgia, Colloquium, Athens, GA, USA, January 2016.

MIT, Seminar and visit to Larry Guth's group, Cambridge, MA, USA, October 2015.

Oakridge National Laboratory, Division of Mathematics Seminar, TN, USA, September 2015.

University of Delaware, Colloquium, DEL, USA, February 2015.

McGill University, Combinatorics Seminar, Montreál, Canada, March 2014.

Fields Institute, Number Theory Seminar, Toronto, Canada, September 2013.

University of Athens, Mathematical Analysis Seminar, Athens, Greece, January 2012.

Universitat Politècnica de Catalunya, Combinatorics Graph Theory and Applications Seminar, Barcelona, Spain December 2011. Invited researcher at UPC: December 2011, May 2012.

Newton Institute, Discrete Analysis Seminar, Cambridge, UK, February 2011.

SELECTED CONTRIBUTED TALKS

New York Number Theory Seminar - CANT, CUNY Graduate Center, NY, USA, May 2016, 2014, 2013.

Combinatorial and Additive Number Theory Conference, Karl-Franzens Universität Graz, Austria, January 2016.

Combinatorics Conference in Lisboa, Universidade Nova, Lisboa, Portugal, July 2011.

Young Workshop in Arithmetics and Combinatorics, ICMAT, Madrid, Spain, June 2011.

TEACHING EXPERIENCE

Lectured the following courses at the University of Georgia in Athens (2016 - present):

- *2000-Level*: Elementary Differential Equations.

Lectured the following courses at the University of Rochester (2012 - 2016):

- *100-Level*: Calculus I, Calculus IA, Discrete Mathematics, Multidimensional Calculus, Linear Algebra with Differential Equations.
- *200-Level*: Introduction to Probability, Linear Algebra, Introduction to Algebra I, Combinatorics, Logic & Set Theory.

Supervised most first and second year courses at at the University of Cambridge (2002 - 2009) and gave Examples Classes for St John's College, University of Cambridge (2004 - 2007).

STUDENT MENTORING

Graduate	Brendan Murphy: lead projects resulting in [8, 9]; co-authored [2].
	Guillem Perarnau: lead the project resulting in [13].
REU	'Tiling sets and spectral sets over finite fields' REU with the participation of 14 students in collaboration with A. Iosevich and J. Pakianathan. Resulted in the preprint [7], 2015.
	Mentor for summer McNair program (which aims to increase graduate degree awards for students from underrepresented segments of society), 2015.
	Lead REU on random regular graphs, 2014.
	Contributed to A. Iosevich's REU on the Erdős distinct distance problem, 2014.
Advising	Four independent study projects on cryptography, combinatorial game theory, educational aspects of mathematics, and Rubik's cube.
	Major advisor for four undergraduates in the University of Rochester.

SERVICE

Analysis and Arithmetic Combinatorics seminar: with N. Lyall and A. Magyar at the University of Georgia in Athens.

Combinatorics seminar: with A. Iosevich and J. Pakianathan at the University of Rochester.

Referee: Bulletin of the London Mathematical Society, Combinatorica, International Journal of Number Theory, International Mathematics Research Notes, Proceedings of the American Mathematical Society, Transactions of the American Mathematical Society.

Outreach: Multiple talks to the Rochester Area Math Circle, to high school students visiting the University of Rochester, and to the University of Rochester S.U.M.S. undergraduate mathematics society.

Public understanding of science: Helped edit science communication guides for the general public, one on medical screening and one on statistics.