GIORGIS PETRIDIS

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EMPLOYMENT

Associate Professor, The University of Georgia, 2021 - present.

Assistant Professor, The University of Georgia, 2016 - 2021.

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.

AWARDS AND EXTERNAL FUNDING

The University of Georgia Creative Research Medal, to recognize a distinct and exceptional research or creative project, performed by a mid-career faculty member, with extraordinary impact and significance to the field of study, 2024.

Simons Foundation MPS-TSM-00007816, 2024 - 2029 (travel support for mathematicians grant).

NSF DMS Award 2054214, 2021 - 2025 (standard grant).

NSF DMS Award 1723016 & Award 1500984, 2015 - 2021 (standard grant, one is continuation of the other).

NSF DMS Award 1804049, 2018 (conference grant for the Georgia Discrete Analysis conference).

AMS-Simons Travel Grant, 2013 - 2015.

EDITORIAL WORK

Editor of **Combinatorial Theory**, 2020 - present.

Member of the Constitution Drafting Committee of **Combinatorial Theory**, 2021 - 2022.

LIST OF PUBLICATIONS

[1] A. Lott, Á. Magyar, G. Petridis and J. Pintz, *Polynomial configurations in dense subsets of the prime lattice*, arXiv:2504.14424, 2025.

[2] A. Mohammadi and G. Petridis, *Almost orthogonal subsets of vector spaces over finite fields*, European J. Combin. 103, 103515, 2022.

[3] B. Murphy, G. Petridis, T. Pham, M. Rudnev and S. Stevens, *On the pinned distances problem in positive characteristic*, J. Lond. Math. Soc.(2) 105 (1), 469–499, 2022.

[4] G. Petridis, O. Roche-Newton, M. Rudnev and A. Warren, *An energy bound in the affine group*, Int. Math. Res. Not. IMRN 2022 (2), 1154–1172, 2022.

[5] B. Hanson and G. Petridis, *A question of Bukh on sums of dilates*, Discrete Analysis 2021:13, 21 pp, 2021.

[6] B. Hanson and G. Petridis, *Refined estimates concerning sumsets contained in the roots of unity*, Proc. Lond. Math. Soc.(3), 122 (3), 353–358, 2021.

[7] S. Macourt, G. Petridis, I. D. Shkredov and I. E. Shparlinski, *Bounds of trilinear and trinomial exponential sums*, SIAM J. Discrete Math. 34 (4), 2124–2136, 2020.

[8] B. Lund and G. Petridis, *Bisectors and pinned distances*, Discrete Comput. Geom. 64 (3), 995–1012, 2020.

[9] G. Petridis and I. E. Shparlinski, *Bounds of trilinear and quadrilinear exponential sums*, J. Anal. Math. 138 (2), 613–641, 2019.

[10] G. Petridis, *Pseudorandomness of large sets in finite fields*, in K.-U. Schmidt and A. Winterhof (eds.), Combinatorics and finite fields: Difference sets, polynomials, pseudorandomness and applications. Radon Series on Computational and Applied Mathematics, Berlin, Boston: de Gruyter, 199-210, 2019.

[11] B. Murphy and G. Petridis, *An example related to the Erdős–Falconer question over arbitrary finite fields*, Bull. Hellenic Math. Soc. 63, 38–39, 2019.

[12] B. Murphy, G. Petridis, O. Roche-Newton, M. Rudnev and I. D. Shkredov, *New results on sum-product type growth over fields*, Mathematika 65 (3), 588–642, 2019.

[13] B. Murphy and G. Petridis, *Products of differences over arbitrary finite fields*, Discrete Analysis 2018: Paper No. 18, 42 pp., 2018.

[14] B. Murphy and G. Petridis, *A second wave of expanders over finite fields*, in Combinatorial and Additive Number Theory II: CANT 2015 and 2016, 215–238, Springer Proc. Math. Stat., 220, Springer, Cham, 2017.

[15] G. Petridis, *Bourgain's sum-product and projection theorems. Part I*, in Arbeitsgemeinschaft: Additive Combinatorics, Entropy, and Fractal Geometry. Oberwolfach Rep. 14, no. 4, 45–47, 2017.

[16] C. Aten et all, *Tiling sets and spectral sets over finite fields*, J. Funct. Anal. 273 (8), 2547–2577, 2017.

[17] G. Petridis, *Pinned algebraic distances determined by Cartesian products in* $\mathbb{F}_p^2$, Proc. Amer. Math. Soc. 145 (11), 4639–4645, 2017.

[18] G. Petridis, *On the number of dot products determined by a large set and one of its translates in finite fields*, Online J. Anal. Comb. 12, #4, 2017.

[19] 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.

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

[21] G. Petridis, *The Plünnecke–Ruzsa inequality: an overview*, in Combinatorial and additive number theory: CANT 2011 and 2012, 229–241, Springer Proc. Math. Stat., 101, Springer, New York, 2014.

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

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

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

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

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

INVITED SPEAKER AT CONFERENCES AND WORKSHOPS

Additive Combinatorics Minisymposium, The Annual 2025 ÖMG-DMV Meeting at the Johannes Kepler University, Linz, Austria, September 2025.

New trends in arithmetic combinatorics and related fields, Banff International Research Station of the Institute of Mathematics at the University of Granada (BIRS-IMAG), Granada, Spain, June 2025.

Combinatorics and Geometric Measure Theory, Institute for Basic Science, Seoul, Korea, July 2024.

Fourier analysis and additive problems, Erdős Center, Rényi Institute, Budapest, Hungary, June 2024.

200 Years of Trinity Combinatorics, Cambridge, UK, July 2023.

4th IPM Biennial Conference on Combinatorics and Computing, IPM, Teheran, Iran (on-line), May 2021.

Pseudo-Randomness and Finite Fields Workshop, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, October 2018.

NSF-CBMS Conference on Additive Combinatorics from a Geometric Viewpoint, University of South Carolina, Columbia, SC USA, May 2018.

Additive Combinatorics, Entropy, and Fractal Geometry Arbeitsgemeinschaften, Mathematisches Forschungsinstitut, Oberwolfach, Germany, October 2017.

Main speaker at 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.

INVITED SEMINAR TALKS AND VISITS

Virginia Tech Analysis Seminar, Blacksburg, VA, October 2024.

Atlanta Discrete Analysis Seminar, Atlanta, GA, October 2023.

University of Rochester, Combinatorics Seminar, NY, USA, April 2023.

Online Ergodic Theory & Analysis Seminar, February 2023.

Carnegie–Mellon University, Combinatorics seminar, Pittsburgh, PA, USA, November 2022.

Greek Mathematical Seminar, April 2022.

University of Tennessee, Colloquium, Knoxville, TN, USA, April 2022.

AMS Central Sectional Meeting on The Interface of Harmonic Analysis and Analytic Number Theory, Purdue University in West Lafayette, Indiana, USA, March 2022.

The University of Mississippi, Number Theory Seminar, Oxford, MS, USA, September 2021.

Copenhagen-Jerusalem Combinatorics Seminar, September 2021.

The Canadian Mathematical Society 75th +1 Anniversary Summer Meeting, Additive and Combinatorial Number Theory session, June 2021. New York Number Theory Seminar, CUNY, New York, NY, USA, February 2021.

Université de Montréal, Quebec-Vermont Number Theory Seminar, Montréal, Canada, November 2020.

Webminar in Additive Combinatorics, May 2020.

University of Rochester, Combinatorics seminar, NY, USA, April 2020.

Universidade NOVA de Lisboa Algebra and Logic seminar, Lisbon, Portugal, June 2019.

Stanford University, Number Theory seminar, CA, USA, January 2019.

National Technical University of Athens, Greece, December 2018.

The Ohio State University, Combinatorics and Probability seminar, Columbus, OH, USA, November 2018.

First congress of Greek Mathematicians (Analysis section), Athens, Greece, June 2018.

Clemson Discrete Mathematics & Algorithms mini conference, Clemson University, Clemson, S.C., USA, November 2017.

19th Atlanta Lecture Series in Graph Theory and Combinatorics, Georgia State University, Atlanta, GA, USA, April 2017.

University of Rochester, Combinatorics seminar, NY, USA, March 2017

Universidad Autónoma de Madrid, Algebra and Number Theory Seminar, Madrid, Spain, December 2016.

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

Georgia State University, Visit, Atlanta, USA, GA, June 2016.

Missouri State University, Colloquium, Springfield, MO, USA, 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.

The University of Georgia, Analysis Seminar, Athens, GA, USA, October 2013.

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.

CONTRIBUTED TALKS

Integers Conference, University of Georgia, Athens, GA, USA, May 2023.

New York Number Theory Seminar - CANT, CUNY Graduate Center, NY, USA, May 2020.

New York Number Theory Seminar - CANT, CUNY Graduate Center, NY, USA, May 2017.

Integers Conference, University of West Georgia, Carrollton, GA, USA, October 2016.

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

University of Rochester, Algebra and Number Theory Seminar, NY, USA, February 2016.

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

University of Rochester, Algebra and Number Theory Seminar, NY, USA, September 2015.

University of Rochester, Algebra and Number Theory Seminar, NY, USA, September 2014.

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

University of Rochester, Algebra and Number Theory Seminar, NY, USA, October 2013.

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

University of Rochester, Probability Seminar, NY, USA, October 2012 .

University of Rochester, Algebra and Number Theory Seminar, NY, USA, September 2012.

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 (2016 - present):

- *1000-Level*: Introduction to Mathematical Modeling.
- *2000-Level*: Calculus II, Honors Calculus II, Elementary Differential Equations.
- *3000-Level*: Applied Linear Algebra.
- *4000-Level*: Combinatorics, Graph Theory, Number Theory.

- *Graduate Topics Courses*: Two courses on Combinatorial Number Theory, a Vertical Research Group on Arithmetic Combinatorics, a course on Ramsey Theory, a course on Entropy.
- *Graduate Reading Courses*: a course on Algebraic Methods in Combinatorics, a course on the Probabilistic Method, a course on Freiman's theorem, a course on the Kelley–Meka work on 3APs.
- *Graduate Training Seminar*: GradFIRST: First-year Research and Scholarship Training Seminar.

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 the following courses at the University of Cambridge (2002 - 2009):

- *Part IA* (first year undergraduate): Analysis I, Differential Equations, Groups, Numbers & Sets, Probability, Vectors & Matrices.
- *Part IB* (second year undergraduate): Analysis II, Complex Analysis, Groups Rings & Modules, Linear Algebra, Metric & Topological Spaces.
- *Certificate of Advanced Studies in Mathematics* (graduate): Functional Analysis.

Examples Classes for St John's College, University of Cambridge (2004 - 2007).

STUDENT MENTORING

Graduate PhD

Dustin Kasser (UGA PhD student in Mathematics): Co-supervisor of PhD Thesis '*Applications of the Techniques of Additive Combinatorics to Cryptography and Dynamical Systems*', (with Á. Magyar). Supported by NSF Award 2054214, 2023 - 2025.

Swaroop Hegde (UGA PhD student in Mathematics)): Supervisor of PhD Thesis. Supported by NSF Award 2054214, 2024 - .

Rishika Agrawal (UGA PhD student in Mathematics): Co-supervisor of PhD Thesis (with P. Pollack), 2024 - . Supported by NSF Award 2054214.

Reddy Ponagandla (UGA PhD student in Mathematics): Co-supervisor of PhD Thesis (with Á. Magyar). Supported by NSF Award 2054214, 2025 - .

Andrew Lott (UGA PhD student in Mathematics): Co-supervisor of PhD Thesis (with Á. Magyar). Supported by NSF Award 2054214, 2025 - .

Graduate Masters

David George (UGA Masters student): Supervised Masters Thesis '*Compressions in Extremal Combinatorics and Additive Number Theory*', 2020.

Dru Horne (UGA Masters student in Math Education): Supervised Masters Thesis '*Some Results on Point-Plane Incidences in* $\mathbb{R}^3$, 2023.

Graduate General	Brendan Murphy: lead projects resulting in [?, ?]; co-authored [?]. Guillem Perarnau: lead the project resulting in [?]. Sixiang Zhang (UGA PhD student in Computer Science): In committee of PhD Thesis. In committee of Masters Thesis 'A mathematical model for RNA 3D structures', 2021. Michaela Coleman (UGA Masters student): mentor, 2024 - 2025.
Undergraduate	Monte Fischer: lead REU in collaboration with Neil Lyall on 'Additive energy on the discrete cube' guided preparation for a public talk titled 'Investigating Additive Combinatorics Through Freiman's Theorem and Plünnecke's Inequality', 2017 - 2018. Fischer received a Goldwater scholarship in 2019. '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 [?], 2015. Carlos Rojas Mena: mentor for summer McNair program (which aims to increase graduate degree awards for students from underrepresented segments of society), 2015.
Advising	Four independent study projects on cryptography, combinatorial game theory, educational aspects of mathematics, and Rubik's cube.

SERVICE

Outreach: Between 2021 – 2025 co-organized the Math Team of Cedar Shoals High School in Athens, GA, USA. Cedar Shoals is a Title I High School. Its students are 57% Black, 23% Hispanic, 41% Economically Disadvantaged, and 16% Students with Disability (supported by NSF DMS Award 2054214). In July 2018, directed a week-long group activity on Combinatorial Geometry at the UGA 2018 Math Camp. 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 (2012 - 2016).

Grant reviewer: ad hoc proposal reviewer for the NSA (2016) and for the NSF (2021 and 2025); review panel member for the NSF (2021).

Conference organization:

- Co-organizer of the Integers Conference in 2023 and 2025.
- Main organizer of a special session on Discrete Analysis at the AMS Spring Southeastern Sectional Meeting at Georgia Tech in March 2023.
- Co-organized the Georgia Discrete Analysis conference at the University of Georgia in May 2018 supported by NSF DMS Award 1804049.

Department service: Member of the Executive Committee 2021 - 2025. Member of the Personnel Committee 2019 - 2021 and 2025–2026. Co-organized the Cantrell Lectures in 2017 and 2025.

Referee: Acta Arithmetica, American Mathematical Monthly, AMS Mathematical Reviews, AMS Student Mathematical Library book series, Annals of Combinatorics, Bulletin of the Australian Mathematical Society, Bulletin of the Hellenic Mathematical Society, Bulletin of the London Mathematical Society, Canadian Journal of Mathematics, Combinatorica, Compositio Mathematica, Contributions to Discrete Mathematics, Discrete Analysis, Discrete and Computational Geometry, Discrete Mathematics, Electronic Journal of Combinatorics,

European Journal of Combinatorics, Finite Fields and Their Applications, Forum Mathematicum, Forum of Mathematics, Integers, International Journal of Number Theory, International Mathematics Research Notices, Israel Journal of Mathematics, Journal of Combinatorial Theory Series A, Journal of Combinatorial Theory Series B, Journal of Number Theory, Journal of the London Mathematical Society, Mathematika, Online Journal of Analytic Combinatorics, Proceedings of the American Mathematical Society, Periodica Mathematica Hungarica, Revista Matemática Iberoamericana, Selecta Matematica, SIAM Journal on Discrete Mathematics, Transactions of the American Mathematical Society.

Public understanding of mathematics: Quoted in Jordana Cepelewicz's article Math's 'Oldest Problem Ever' Gets a New Answer that appeared in Quanta Magazine in March 2022.

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