

Curriculum Vitae: Akos Magyar

Department of Mathematics

University of Georgia

Academic Degrees

Doctorate, Ph.D.,
Princeton University, Princeton, NJ, 1996

Ph.D. Advisor,
Elias M. Stein

Diploma
Eotvos Lorand University, Budapest, 1989

Academic Appointments

Professor, University of Georgia, 2014–

and

Fourier Analysis, Ergodic Theory, Additive Combinatorics
Analytic Number Theory, Complex Analysis, Probability Theory
Real Analysis, Differential Equations

Teaching Activities

Associate Professor, University of British Columbia, 2008–2013

Harmonic Analysis, Ergodic Theory, Number Theory,
Real and Complex Analysis, Differential
and Integral Calculus

Associate Professor, University of Georgia, 2005–2007
Combinatorial Number Theory, Fourier Analysis, Differential Equations

Assistant Professor, University of Georgia, 2001–2004
Real and Complex Analysis, Dynamical Systems, Differential and Integral
Calculus

Postdoctoral Fellow (Van Vleck Assistant Professor), University of Wisconsin–
Madison, 1998–2001, Linear Differential Equations, Finite Mathematics

Postdoctoral Fellow (H. Bateman Research Instructor), California Institute of
Technology, 1997–98
Real and Complex Function Theory, Introduction to Mathematical Chaos Theory

Graduate Student (Graduate Teaching/Research Assistant), Princeton Univer-
sity, 1991–95, Differential and Integral Calculus I–II

Visiting Research Appointments	MTA Visiting Researcher, Alfréd Rényi Institute of Mathematics, Budapest, 2024,
	Visiting Professor, Hausdorff Institute of Mathematics (HIM), Bonn, 2021
	Visiting Researcher, Mathematical Sciences Research Institute (MSRI), Berkeley, CA, 2017
	Visiting Researcher, Institute for Advanced Study (IAS), Princeton, NJ, 1996–1997
Research Areas	Analytic Number Theory, Fourier Analysis Ergodic Theory, Geometric Ramsey Theory
External Funding Grants and Awards	“Polynomial Patterns in Ergodic and Geometric Ramsey Theory”, SIMONS Travel Grant SFI-MPS-TSM-00026118, 2026–2031 “Problems in discrete analysis, ergodic and Ramsey theory”, SIMONS Travel Grant SFI-MPS-TSM-854813, 2021–2026 “Some Problems at the Interface of Harmonic Analysis, Number Theory, and Combinatorics”, NSF Award DMS 1600840’ 2016–2020 “Discrete problems in harmonic analysis with applications to ergodic theory and additive combinatorics”, NSERC Discovery Grant 371993-09, 2009–2014, “Problems on the interface of analysis, ergodic and additive number theory”, NSF Award DMS 0803190, 2008–2009 “New Trends in Harmonic Analysis”, NSF FRG Award DMS 0456490, 2005–2008 “Discrete problems in harmonic analysis, ergodic theorems and singularities”, NSF FRG Award DMS 0456490, for the proposal, 2002–2005 “Problems in analysis related to lattice points and singularities”, NSF FRG Award DMS 0456490, 1998–2001

**Supervision
Ph.D.
Students**

Doctoral Students:

Andrew Lott (2023–)

Nagendar Ponagandla (2023–)

Dustin Kessler (2021–2025) (with G. Petridis)

Peter Wolfitt, Ph.D. (2018–2023), (with N. Lyall)

Alexander Newman, Ph.D. (2018–2022), (with N. Lyall)

Hans Parshall, Ph.D. (2015–2017) (with N. Lyall)

Thatchai Titichetrakun, Ph.D. (2012–2016)

Robert Fraser, M.Sc. (2011–2013)

Brian Cook, Ph.D. (2008–2013)

James D. Blair, Ph.D. (2003–2005)

Postdoctoral Researchers:

Brian MacDonald (2023–)

Brandon Hanson (2018–2021)

Matt Bond (2011–12) (with I. Laba)

John Griesmer (2009–2011) (with I. Laba)

Matthew Smith (2008–2011)

Neil Lyall (2005–2007)

**Professional
Service**

Conference Organization:

Simons Semester on Modern Harmonic analysis and applications, Erdős Center, Budapest (2026, 01.01–06.30) (with R. Greenfeld, M. Mirek, and A. Toth)

AMS Fall Southeastern Sectional Meeting, Discrete Analysis Session
New Orleans, LA (October 3–5, 2025) (with N. Lyall and T. Szarek)

AMS Spring Southeastern Sectional Meeting, Additive Combinatorics Session
Atlanta, GA, (2023) (with N. Lyall and G. Petridis)

Georgia Discrete Analysis Conference (2018), Athens, GA
(with N. Lyall and G. Petridis)

2010 Winter Meeting of the Canadian Mathematical Society (CMS), Additive Combinatorics Session (with I. Laba and M. Pramanik), Vancouver, Canada (2010)

NSF FRG Conference - New Developments in Harmonic Analysis, Athens, GA (2007) (with N. Lyall)

AMS Sectional Meeting on Harmonic Analysis, Harmonic Analysis Session
Atlanta, GA, (2002) (with G. Mockenhaupt)

Scientific Review Panels:

National Science Foundation (NSF), Division of Mathematical Sciences,
Grant Review Panel, 2013, 2017, 2019

External Examiner, Ph.D. Thesis Committees

Wojciech Slomian, Ph.D. (2023), Wroclaw University of Science and Technology
Faculty of Pure and Applied Mathematics

Simao Herdade, Ph.D. (2015), Rutgers University,
Department of Computer Science

International Scientific Collaborations:

NKFIH, Excellence 15421, 2026-2027
“Application of Fourier analysis in estimation of linear programming”,
Máté Matolcsi (Principal Investigator)

ERC Advanced Grant AdG 321104 *“Regularity”*, 2013–2017
European Research Council (ERC), Endre Szemerédi (Principal Investigator)

**Professional
Service**

Membership in Scientific Organizations:

Hungarian Academy of Sciences (MTA), Public Body

American Mathematical Society (AMS)

Scientific Continuing Education, Summer Schools:

Summer School, *Simons School on Harmonic analysis and applications to Ramsey theory* (Budapest, June 2026)

Summer School, *Simons School on Discrete harmonic analysis and analytic number theory* (Budapest, May 2026)

Seminar Course, *Modular forms and applications*
(Athens, GA, July 2022)

Scientific Committee, Summer School *Finite point configurations and discrete integrable systems* (Armenia, July 2020)

Seminar Course, *Discrete analysis, geometric measure theory*
(Athens, GA, July 2017)

Summer School, *Ramsey Theory*, research program for undergraduate students (NSF Research Experience for Undergraduates) (Athens GA, June–July 2006)

Refereeing for International Journals:

Annals of Math., Acta Math., Acta Arithm., Acta Math. Hung., Amer. J. Math., Anal. PDE, Bull. London Math. Soc., Crelle, Compositio Math., Duke Math. Journal, Invent. Math., Israel J. Math., J. Amer. Math. Soc., J. London Math. Soc., Math. Z., Proc. A.M.S., Proc. Cambridge Phil. Soc., J. London Math. Soc., Trans. Amer. Math. Soc., Math. Z.

- Publications**
1. *Cyclic quadrilaterals and Gowers' U^3 uniformity norm* (preprint)
 2. *Simplex-center configurations in Euclidean spaces and the integer lattice* (preprint)
 3. *Sárközy's theorem for an even number of odd powers* (with A. Kaligoriu, A. Lott, A. Singha-Roy) (preprint)
 4. *On almost prime solutions of diophantine systems of odd degree forms in many variables* Analysis Math. (to appear)
 5. *The VC-dimension and point configurations in $\mathbb{R}^d$* (with A. Iosevich, A. MacDonald, B. Macdonald) (submitted)
 6. *Polynomial configurations in dense subsets of the prime lattice* (with A. Lott, G. Petridis, J. Pintz) Acta Arithm. (to appear)
 7. *On the frequency of small gaps between primes* (with J. Pintz) J. Number Theory (to appear)
 8. *Polynomial averages and pointwise ergodic theorems on nilpotent groups, I: Step two groups* (with A. Ionescu, M. Mirek, T. Szarek) Inventiones Mathematicae 231.3 (2023): 1023–1140
 9. *Polynomial sequences in step-2 nilpotent groups* (with A. Ionescu, M. Mirek, T. Szarek) Advanced Nonlinear Studies, 23.1 (2023): 20230085
 10. *Simplices in thin subsets of Euclidean spaces* (with A. Iosevich) Analysis PDE 16, no.7 (2023): 1485–1496.
 11. *Weak hypergraph regularity and applications to geometric Ramsey theory.* (with N. Lyall) Trans. Amer. Math. Soc., v.9(5), (2022) 160–207
 12. *The Discrete Spherical Maximal Function A new proof of L^2 -boundedness.* (with N. Lyall, A. Newman, P. Wolfitt) Proc. AMS. 149(12) (2021) 5305–5312
 13. *Discrete multilinear maximal operators associated to simplices.* (with B. Cook, N. Lyall) J. London Math. Soc. 104(4) (2021) pp. 1491–1514
 14. *Distances and trees in dense subsets of $\mathbb{Z}^d$,* (with N. Lyall) Israel J. Math. 240(2) (2021) pp. 769–790
 15. *Spherical configurations over finite fields.* (with N. Lyall, H. Parshall) Amer. J. Math. v. 142/2. (2020) pp. 373–404

- Publications**
16. *Distance graphs and sets of positive upper density in R^d* , (with N. Lyall) Anal. PDE v. 13/3 (2020) pp. 385–400
 17. *A multidimensional Szemerédi theorem in the primes*, (with B. Cook, T. Titichetrakun) Annals of Comb., 22/4, (2018) pp. 711–768
 18. *Product of simplices and sets of positive density in R^d* , (with N. Lyall) Math. Proc. Cambridge Phil. Soc., v 165/1, (2018) pp. 25–51
 19. *A Roth type theorem for dense subsets of R^d* , (with B. Cook, M. Pramanik) Bull. London Math. Soc., v 49/4, (2017) pp. 1473–1489
 20. *Embedding simplices into sets of positive upper density in R^d* (with L. Huckaba, N. Lyall) Proc. A.M.S., v.145, (2017) pp. 2335–2447
 21. *Almost prime solutions of diophantine systems of high rank*, (with T. Titichetrakun) Int. J. Num. Theory., v 13/5, (2017) pp. 1491–1514
 22. *Diophantine equations in the primes* (with B. Cook) Inventiones Math.: v 198/3, (2014) pp. 701–737
 23. *"Averages along polynomial sequences in discrete nilpotent groups: Singular Radon transforms* (with A. Ionescu, S. Wainger) Advances in Analysis: The Legacy of E. M. Stein, Princeton Univ. Press (2014), pp. 146–185
 24. *On the distribution of solutions to diophantine equations* in Panorama of Discrepancy Theory, Lecture Notes in Mathematics Springer-Verlag (2014), pp. 449–483
 25. *Optimal polynomial recurrence* (with N. Lyall) Canadian J. Math. 65, (2013) pp. 171–194
 26. *Constellations in P^d* (with B. Cook), Int. Math. Res. Notices, I.M.R.N, 12, (2012) pp. 2794–2816
 27. *On restricted arithmetic progressions over finite fields* (with B. Cook) Online J. of Anal. Comb., 7, (2012) pp. 1–10
 28. *Simultaneous polynomial recurrence* (with N. Lyall) Bull. London Math. Soc. 43(4), (2011) pp. 765–785
 29. *K-point configurations in sets of positive density of $\mathbb{Z}^n$* Duke Math. Journal 146/1, (2009) pp. 1–34
 30. *Polynomial configurations in difference sets* (with N. Lyall) J. Number Theory, v. 129/2, (2009) 439–450

Publications

31. *On Fourier restriction and the Newton polygon*
Proc. AMS. v. 137/2, (2009) pp. 615–625
32. *On distance sets of large sets of integer points*
Israel J. Math., (2008) v.164/1, pp. 251–263
33. *Discrete Radon transforms and applications to Ergodic theory*
(with A. Ionescu, E. M. Stein, S. Wainger) Acta Mathematica v.198, (2007) pp. 231–298
34. *Maximal operators associated to discrete subgroups of nilpotent groups*
(with E. M. Stein, S. Wainger) J. d'Analyse Math., v.101, (2007) pp. 257–313
35. *On the distribution of lattice points on spheres and on level surfaces of polynomials* J. Number Theory, v.122/1, (2007) pp. 69–83
36. *Discrete maximal functions and ergodic theorems related to polynomials*
in Fourier Analysis and Convexity, ANHA, (2004)
37. *Discrete analogues in Harmonic Analysis: Spherical Averages*
(with E. M. Stein and S. Wainger)
Annals of Mathematics v.155, (2002) pp. 189–208,
338. *Diophantine equations and Ergodic theorems*
American J. Math. v.124, (2002) pp. 921–953
39. *On the Discrepancy of Point Distributions on Symmetric Spaces*
Monats. Math. v.136, (2002) pp. 287–296
40. *Estimates for the Wave kernel near focal points*
J. Geom. Anal. v.11/1, (2001) pp. 120–128
41. *L^p -Bounds for Spherical Maximal Operators on $\mathbb{Z}^n$*
Rev. Math. Iberoam. v.13/2, (1997) pp. 307–317
42. *Estimates for the Wave Operator on the Torus Π^n for large time*
Proc. AMS, v.125/7, (1997), pp. 1969–1976
43. *Restrictions of partial isometries*
(with Z. Sebestyen) Per. Math. Hung., v.23, 92, 159–62
44. *Restrictions of partial isometries II.*
(with Z. Sebestyen) Per. Math. Hung., v.25, 92, 171–74
45. *Quasipolynomial bounds for subsets of $\mathbb{Z}^d$ lacking k -point configurations*
(with A. Lott and N. Ponagandla) (in preparation)
46. *Diophantine equations*, De Gruyter Studies in Mathematics
De Gruyter Publishing (in preparation)

**Invited
Talks**

"Almost primes solutions to forms of odd degrees in many variables"
Workshop on Additive and Combinatorial Number Theory (CANT 2026)
Satellite Conference of ICM 2026, CUNY New York, (June 2026)

"Density Ramsey Theory in $\mathbb{Z}^d$: Simplexes, Barycenters and Beyond"
Joint Colloquium of the HUN-REN A. Rényi Institute of Mathematics
and Eötvös Lóránd University, Budapest, Hungary (February 2026)

"Exponential sums, polynomial ergodic theorems and nilpotent groups"
(50-min. Invited Address) Fall Southeastern Sectional Meeting of the AMS
New Orleans, LA (October, 2025)

"Diophantine equations and discrete harmonic analysis"
(Invited Lecture Series) Wrocław, Poland (September 2024)

"Polynomial configurations in dense subsets of the prime lattice"
Number Theory Seminar, Alfred Renyi Institute of Mathematics
Budapest, Hungary (November, 2024)

"A Roth type result for dense subsets of the integer lattice"
Joint Emory–Georgia Inst. of Tech. Discrete Analysis Seminar,
Atlanta, GA (October 2024)

"Geometric configurations in sets of positive density"
In Contemporary Harmonic Analysis and its Synergies,
Warsaw, Poland (September 2024)

"Embedding distance graphs into thin sets of Euclidean spaces"
In Second Analysis Mathematica Conference, Budapest, Hungary (August 2024)

"Geometric configurations in dense subsets of the integer lattice"
In Additive Combinatorics and Fourier Analysis Workshop, Erdős Center,
Budapest, Hungary (June, 2024)

"On a conjecture of Bergelson–Leibman in ergodic theory" In Workshop in
Analysis, Atlanta, GA (December 2023)

"Waring problem, nilpotent groups and averages along polynomial sequences" In
Elias M. Stein Memorial Conference, Princeton, NJ (June 2023)

"Simplexes in thin sets of Euclidean spaces" In AMS Special Session on Harmonic
Analysis, Atlanta, GA (March 2023)

"Multilinear maximal operators associated to simplices"
11th International Conference on Harmonic Analysis, El Escorial, Madrid,
ICMAT (June 2022)

"Discrete harmonic analysis and pointwise ergodic theorems" In AMS Special
Session on Crossroads: Ergodic Theory, Harmonic Analysis, and Combinatorics,
(online) (March 2022)

**Invited
Talks**

"Geometric point configurations in sets of positive upper density"

Joint Seminar on Analysis, Eotvos Lorand University and
A. Renyi Institute of Mathematics, (May 2022)

"Embedding metric graphs in thin sets"

Arithmetic and Harmonic Analysis, Institut Mittag-Leffler (online) (June 2021)

"Distance graphs in sets of positive density" Additive and Combinatorial
Number Theory, CMS 75th Anniversary Summer Meeting (online) (June 2021)

"Pointwise ergodic theory"

Math. Dept. Colloquium, Univ. of Georgia (online) (March 2021)

"Spherical point configurations"

CANT, Jean Bourgain Memorial Meeting, New York, NY (May 2019)

"Maximal functions on Integer points"

Workshop on Combinatorics and Additive Number Theory, CUNY, (May 2018)

"Embedding distance graphs in sets of positive density"

Joint UCLA-Caltech Analysis Seminar, UCLA (April 2018)

"Geometric configurations in sets of positive density"

Analysis and Applications: Conference in honor of Elias M. Stein.
Wroclaw, Poland (September 2017)

"Geometric Ramsey theory"

Colloquium, Dept. of Math., Univ. of Wisconsin-Madison (September 2016)

"New and old results in geometric Ramsey theory"

Workshop on discrepancy theory, Varenna, Italy (June 2016)

"On a Roth type theorem for dense subsets of $\mathbb{R}^d$ "

Analysis Seminar, Univ. of Indiana, Bloomington (September 2016)

"Configurations in dense subsets of P^d "

AMS Joint Mathematics Meeting, Seattle (January 2016)

"On the distribution of integer and prime solutions to diophantine equations"

CMS Winter Meeting, Montreal, Canada (Dec. 2015)

"Linear Pattern in dense subsets of the prime lattice"

Additive Combinatorics, CIRM, Marseilles, France (2015)

"Almost prime points on smooth, homogeneous varieties"

New Horizons in Additive Combinatorics, Montreal, Canada (2014)

"Prime and Almost Prime solutions of diophantine systems"

Workshop on Additive and Analytic Combinatorics, IMA, Minneapolis (2014)

**Invited
Talks**

"Diophantine equations in the primes"

Workshop on Analytic Number theory, Oberwolfach, Germany (2013)

"The ergodic proof of Szemerédi's theorem"

Arbeitsgemeinschaft: Ergodic Theory and Combinatorial Number Theory
Germany, Oberwolfach (2012)

"Quadratic and cubic forms over the primes"

Analytic Methods for Diophantine Problems, Gottingen, Germany (2012)

"Linear and quadratic equations among the primes"

Colloquium, Department of Mathematics, UW–Madison, Madison (2012)

"Constellations in P^d ", 27th Journee Arithmetique, Vilnius, Lithuania (2011)

"Discrete singular Radon transforms on step-2 nilpotent groups"

Oscillatory Integrals in Harmonic Analysis, ICMS, Edinburgh, United Kingdom
(2011)

"Discrete problems in harmonic analysis and some applications"

Lectures on Harmonic Analysis in honor of Stephen Wainger, Madison, Wisconsin
(2011)

"Singular averages along polynomial sequences on nilpotent groups"

Workshop on Euclidean Harmonic Analysis, Nilpotent Lie Groups and PDEs,
CRN, Pisa, Italy (2010)

"Singular Radon transforms on discrete nilpotent groups"

Joint Meeting of the CMS–SMM, Vancouver, British Columbia (2009)

"Double recurrence in finite fields and algebraic sets"

9th International Conference on Finite Fields and its Applications, Dublin (2009)

"Singular Radon transforms on discrete nilpotent groups: A model case"

University of Arkansas Spring Lecture Series, Arkansas (2009)

"On the distribution of large sets of integer points on spheres"

Colloquium, Universita di Milano-Bicocca, Milan (2009)

"Singular Radon transforms on discrete nilpotent groups", Joint Meeting of the
CMS–SMM, Vancouver (2009)

"Simultaneous polynomial return times", *Workshop on harmonic analysis*

Oberwolfach, Germany, (2008)

"On polynomial recurrence"

AMS Sectional Meeting, Vancouver, Canada (2008)

**Invited
Talks**

" *A coloring problem for squares*"
Conference on harmonic analysis, Fields Institute, Toronto, Canada, (2008)

" *K-point configurations in sets of positive density of $\mathbf{Z}^n$* "
Conference on Harmonic Analysis and PDE,
Satellite Conference of the ICM, Seville, Spain (2006)

" *Maximal functions and ergodic theorems associated to discrete nilpotent groups*"
Joint Winter Meeting of the CMS, Toronto, Canada (2006)

" *Maximal Radon transforms on discrete step-2 nilpotent groups and applications to ergodic theory*"
AMS Sectional Meeting, Salt Lake City, Utah (June 2006)

" *Embedding simplices into large subsets of integer points*"
Workshop on Additive Combinatorics, Montreal, Canada, (2006)

" *Some arithmetic properties of integer points*"
Analysis Seminar, UCLA, (Oct. 2006)

" *Maximal Radon transforms on discrete step-2 nilpotent groups and applications to ergodic theory*"
AMS Sectional Meeting, Salt Lake City, Utah (June 2006)

" *Embedding simplices into large subsets of integer points*"
Workshop on Additive Combinatorics, Montreal, Canada, (2006)

" *Some arithmetic properties of integer points*"
Analysis Seminar, UCLA, (Oct. 2006)

" *On Fourier restriction and the Newton polygon*"
Joint Winter Meeting of the CMS, Montreal, Canada (Jan. 2005)
" *Polynomial type ergodic theorems on nilpotent groups*"
Fourth Prairie Analysis Seminar, University of Kansas
(Nov. 2004)

" *Solutions of diophantine equations in difference sets of large subsets of integer points*"
International Workshop on Harmonic Analysis, Pisa, Italy (2004)

" *Application of the Hardy–Littlewood method of exponential sums*"
Colloquium on Number Theory, A. Renyi Institute, Budapest, Hungary
(May 2003)

" *Polynomial type ergodic theorems related to discrete nilpotent groups*" at
International workshop on Harmonic Analysis and Number Theory,
Vienna (March 2003)

**Invited
Talks**

"On the irregularities of distribution of lattice points on spheres"
Regional Conference of the AMS, Madison, WI (2002)

"Discrete maximal functions and ergodic theorems related to polynomials"
Joint AMS Summer Conference on Harmonic Analysis, Massachusetts
(June 2001)

" $L^p \rightarrow L^q$ bounds for the half-wave operator with simple singularities"
6th International Conference on Harmonic Analysis and PDE
El Escorial, Spain (July 2000)

"On the distribution of solutions to diophantine equations"
Number Theory Colloquium, Debrecen, Hungary (July 2000)

" L^p bounds for the discrete spherical maximal operator"
Conference on Harmonic Analysis in honour of Stephen Wainger, Madison, WI
(Jan. 1999)

"Dimension free estimates for maximal operators"
Harmonic Analysis Conference in honor of Jean-Pierre Kahane, Orsay
(July 1993)