

## Publications by Ben Green

January 2025

- [1] *The number of squares and  $B_h[g]$ -sets*, Acta Arithmetica **100** (2001) no. 4, 365–390.
- [2] *On arithmetic structures in dense sets of integers*, Duke Math. Jour. **114** (2002) no. 2, 215–238.
- [3] *Arithmetic progressions in sumsets*, GAFA **12** (2002) no. 3, 584–597.
- [4] *Some constructions in the inverse spectral theory of cyclic groups*, Comb. Prob. Comp. **12** (2003) no. 2, 127–138.
- [5] (with Imre Ruzsa) *Counting sumsets and sum-free sets modulo a prime*, Studia Sci. Math. Hungarica **41** (2004), no. 3, 285–293.
- [6] *The Cameron-Erdős Conjecture*, Bull. London Math. Soc. **36** (2004), no. 6, 769–778.
- [7] *Spectral structure of sets of integers*, in Fourier analysis and convexity, 83–96, Appl. Numer. Harmon. Anal., Birkhauser Boston, Boston, MA, 2004.
- [8] (with Imre Ruzsa) *On the Hardy-Littlewood majorant problem*, Math. Proc. Camb. Phil. Soc. **137** (2004), no. 3, 511–517.
- [9] *Counting sets with small sumset, and the clique number of random Cayley graphs*, Combinatorica **25** (3) (2005), 307–326.
- [10] *A Szemerédi-type regularity lemma in abelian groups*, GAFA **15** (2005), no. 2, 340–376.
- [11] (with Imre Ruzsa) *Sum-free sets in abelian groups*, Israel J. Math **147** (2005), 157–189.
- [12] *Roth’s Theorem in the primes*, Annals of Math. **161** (2005), no. 3, 1609–1636.
- [13] *Finite field models in additive combinatorics*, Surveys in Combinatorics 2005, London Math. Soc. Lecture Notes **327**, 1–27.
- [14] (with Imre Ruzsa) *Sets with small sumset and rectification*, Bull. London Math. Soc. **38** (2006), no. 1, 43–52.
- [15] (with Terence Tao) *Restriction theory of the Selberg sieve, with applications*, Jour. Th. Nombres Bordeaux **18** (2006), 147–182.
- [16] (with Terence Tao) *The primes contain arbitrarily long arithmetic progressions*, Annals of Math. **167** (2008), 481–547.
- [17] (with Imre Ruzsa) *Freiman’s theorem in an arbitrary abelian group*, Jour. London Math. Soc. **75** (2007), no. 1, 163–175.

- [18] (with Terence Tao) *Compressions, convex geometry and the Freiman-Bilu theorem*, Quart. Jour. Math. **57** (2006), no. 4, 495–504.
- [19] *Generalising the Hardy-Littlewood method for primes*, International Congress of Mathematicians. Vol. II, 373-399, Eur. Math. Soc., Zurich, 2006.
- [20] (with Terence Tao) *An inverse theorem for the Gowers  $U^3$ -norm, with applications*, Proc. Edinburgh Math. Soc. **51** (2008), no. 1, 73–153.
- [21] *Long arithmetic progression of primes*, in Analytic Number Theory: a tribute to Gauss and Dirichlet (ed. Duke, Tschinkel), Clay Mathematics Proceedings **7** (2007), 149–168.
- [22] (with Terence Tao) *New bounds for Szemerédi’s theorem, I: Progressions of length 4 in finite field geometries*, Proc. Lond. Math. Soc. (3) **98** (2009), no. 2, 365–392. (This paper has an error and is corrected by [58].)
- [23] (with Sergei Konyagin) *On the Littlewood problem modulo a prime*, Canad. J. Math. **61** (2009), no. 1, 141–164.
- [24] *Montréal lecture notes on quadratic Fourier analysis*, in Additive Combinatorics (Montréal 2006, ed. Granville et al.), CRM Proceedings vol. **43**, 69–102, AMS 2007.
- [25] (with Tom Sanders) *Boolean functions with small spectral norm*, GAFA **18** (2008), 144–162.
- [26] (with Terence Tao) *Quadratic uniformity of the Möbius function*, Annales de l’Institut Fourier (Grenoble) **58** (2008), no. 6, 1863–1935.
- [27] (with Terence Tao) *Linear equations in primes*, Annals of Math. **171** (2010), no. 3, 1753–1850.
- [28] (with Terence Tao) *New bounds for Szemerédi’s theorem, II: a new bound for  $r_4(N)$* , in Analytic Number Theory (special volume in honour of Klaus Roth, ed Chen et al) 180–204.
- [29] (with Tom Sanders) *A quantitative version of the idempotent theorem in harmonic analysis*, Annals. of Math. **168** (2008), no. 3, 1025–1054.
- [30] (with Terence Tao) *A note on the Freiman and Balog-Szemerédi-Gowers theorems in finite fields*, J. Aust. Math. Soc. **86** (2009), no. 1, 61–74.
- [31] (with Terence Tao) *Freiman’s theorem in finite fields via extremal set theory*, Combinatorics, Probability and Computing **18** (2009), no. 3, 335–355.
- [32] (with Terence Tao) *The quantitative behaviour of polynomial orbits on nilmanifolds*, Annals of Math. **175** (2012), no. 2, 465–540. *Erratum*: Annals of Math. **179** (2014), no. 3, 1175–1183.
- [33] (with Olof Sisask) *On the maximal number of three-term arithmetic progressions in subsets of  $\mathbb{Z}/p\mathbb{Z}$* , Bull. Lond. Math. Soc. **40** (2008), no. 6, 945–955.
- [34] *Three topics in additive prime number theory*, Current Developments in Mathematics 2007, 1-41, Int. Press, Somerville MA.

- [35] (with Terence Tao) *The distribution of polynomials over finite fields, with applications to the Gowers norms*, Contrib. Discrete Math **4** (2009), no. 2, 1–36.
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- [37] *On a variant of the large sieve*, 7 pages. <http://arxiv.org/abs/0807.5037>
- [38] (with Julia Wolf) *A note on Elkin’s improvement of Behrend’s construction*, in Additive Number Theory (Festschrift in honour of Mel Nathanson), Springer 2010, 141–144.
- [39] (with Terence Tao) *An equivalence between inverse sumset theorems and inverse conjectures for the  $U^3$ -norm*, Math. Proc. Camb. Phil. Soc. **149** (2010), no. 1, 1–19.
- [40] (with Emmanuel Breuillard) *Approximate groups, I: The torsion-free nilpotent case*, J. Inst. Math. Jussieu **10** (2011), no. 1, 37–57.
- [41] (with Emmanuel Breuillard) *Approximate groups, II: The solvable linear case*, Quart. J. Math. **62** (2011), no. 3, 513–521.
- [42] *Approximate groups and their applications: work of Bourgain, Gamburd, Helfgott and Sarnak*, 25 pages, Current Events Bulletin of the AMS, 2010.
- [43] (with Terence Tao and Tamar Ziegler) *An inverse theorem for the Gowers  $U^4$ -norm*, Glasgow Math. J. **53** (2011), 1–50.
- [44] (with Emmanuel Breuillard and Terence Tao) *Linear approximate groups*, (announcement) Electron. Res. Announc. Math. Sci **17** (2010), 57–67.
- [45] (with Terence Tao) *An arithmetic regularity lemma, associated counting lemma, and applications*, in An irregular mind: Szemerédi is 70, Bolyai Society Math. Studies **21** (2010), 261–334.
- [46] (with Terence Tao) *Yet another proof of Szemerédi’s theorem*, 6 pages, in An irregular mind: Szemerédi is 70, Bolyai Society Math. Studies **21** (2010), 335–342.
- [47] (with Emmanuel Breuillard and Terence Tao) *Suzuki groups as expanders*, Groups Geom. Dyn. **5** (2011), 281–299.
- [48] (with Emmanuel Breuillard and Terence Tao) *Approximate subgroups of linear groups*, GAFA **21** (2011), no. 4, 774–819.
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- [50] (with Emmanuel Breuillard) *Approximate groups, III: The unitary case*, Turkish J. Math. **36** (2012), 199–215.
- [51] (with Terence Tao and Tamar Ziegler) *An inverse theorem for the Gowers  $U^{s+1}[N]$ -norm*, Annals of Math. **176** (2012), no. 2, 1231–1372.

- [52] (with Emmanuel Breuillard, Bob Guralnick and Terence Tao) *Strongly dense free subgroups of semisimple algebraic groups*, Israel J. Math. **192** (2012), no. 1, 347–379.
- [53] (with Emmanuel Breuillard and Terence Tao) *A note on approximate subgroups of  $GL_n(\mathbb{C})$  and uniformly nonamenable groups*, 5 pages, to appear in Glasgow Math. J.
- [54] *On (not) computing the Mobius function using bounded depth circuits*, Combinatorics, Probability and Computing **21** (2012), no. 6, 942–951.
- [55] (with Emmanuel Breuillard and Terence Tao) *The structure of approximate groups*, Publications mathématiques de l’IHÉS **116** (2012), no. 1, 115–221.
- [56] (with Emmanuel Breuillard) *Contractions and expansion*, Eur. J. Comb. **34** (2013), no. 8, 1293–1296.
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- [58] (with Terence Tao) *New bounds for Szemerédi’s theorem, Ia: progressions of length 4 in finite field geometries revisited*, 16 pp. arxiv:1215.1330
- [59] (with Terence Tao) *On sets defining few ordinary lines*, Discrete and Computational Geometry **50** (2013), no. 2, 409–468.
- [60] (with Emmanuel Breuillard and Terence Tao) *Small doubling in groups*, in Erdős Centennial, Bolyai Society Mathematical Studies **25** (2013), 129–151.
- [61] (with Sean Eberhard and Freddie Manners) *The sum-free set constant is  $\frac{1}{3}$* , Ann. Math **180** (2014), no. 2, 621–652.
- [62] (with Rob Morris) *Counting sets with small sumset and applications*, Combinatorica **36** (2016), no. 2, 129–159.
- [63] *The chromatic number of random Cayley graphs*, Comb. Prob. Computing **26** (2017), no. 2, 248–266.
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- [65] (with Adam Harper) *Inverse questions for the large sieve*, GAFA **24** (2014), no. 4, 1167–1203.
- [66] *Approximate algebraic structure*, Proceedings of the International Congress of Mathematicians, Seoul 2014. Vol. 1, 341–367, Kyung Moon Sa, Seoul, 2014.
- [67] (with Kevin Ford, Sergei Konyagin and Terence Tao) *Large gaps between consecutive prime numbers*, Ann. of Math. (2) **183** (2016), no. 3, 935–974.
- [68] (with Kevin Ford, Sergei Monyagin, James Maynard and Terence Tao) *Long gaps between primes*, J. Amer. Math. Soc. **31** (2018), no. 1, 65–105.

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- [70] (with Sean Eberhard and Kevin Ford) *Invariable generation of the symmetric group*, Duke Math. J. **166** (2017), no. 8, 1573–1590.
- [71] (with Tom Sanders) *Monochromatic sums and products*, Discrete Analysis 2016:5, 48pp.
- [72] *A note on multiplicative functions on progressions to large moduli*, Proceedings of the Royal Society of Edinburgh, 148 (2018), 63–77.
- [73] *Sárközy’s theorem in function fields*, Quarterly J. Math. **68** (2017), no. 1, 237–242.
- [74] (with Sofia Lindqvist) *Monochromatic solutions to  $x+y = z^2$* , Canadian Journal of Mathematics **71** (2019), no. 3, 579–605.
- [75] (with Daniel Kane) *An example concerning set addition in  $\mathbf{F}_2^n$* , to appear in Harmonic analysis, approximation theory and number theory, special volume of Proc Steklov Math. Inst. in honour of the 60th birthday of Sergei Konyagin.
- [76] (with Joël Bellaïche and Kannan Soundararajan), *Non-zero coefficients of half-integral weight modular forms mod  $\ell$* , Research in the Mathematical Science 2018 5:6.
- [77] (with Terence Tao), *New bounds for Szemerédi’s theorem, III: A polylogarithmic bound for  $r_4(N)$* , Mathematika (special volume in honour of Klaus Roth) **63** (2017), no. 3, 944–1040.
- [78] (with Imre Ruzsa), *On the arithmetic Kakeya conjecture of Katz and Tao*, Period. Math. Hungarica **78** (2019), 135–151.
- [79] *On the width of transitive sets: bounds on matrix coefficients of finite groups*, Duke Math. J. **169** (2020), no. 3, 551–578.
- [80] (with Kevin Ford and Dimitris Koukoulopoulos) *Equal sums in random sets and the concentration of divisors*, Invent. Math. **232** (2023), no. 3, 1027–1160.
- [81] *On a conjecture of Gowers and Long*, Bull. London Math. Soc **52** (2020), no. 6, 1148–1157.
- [82] (with Dávid Matolcsi, Imre Ruzsa, George Shakan and Dmitrii Zhelezov) *A Weighted Prékopa-Leindler inequality and sumsets with quasicubes*, in: Avila, A., Rassias, M.T., Sinai, Y. (eds) Analysis at Large. Springer 2022, 125–129.
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- [84] (with Aled Walker) *Extremal problems for GCDs*, Combin. Probab. Comput. **30** (2021), no. 6, 922–929.
- [85] *New lower bounds for van der Waerden numbers*, Forum of Math Pi **10** (2022), e18.
- [86] *Lower bounds for corner-free sets*, New Zealand J. Math **51** (2021), 1–2.

- [87] *Quadratic forms in 8 prime variables*, 55pp, preprint. arXiv:2108.10401.
- [88] *On Sárközy's theorem for shifted primes*, J. Amer. Math. Soc. **37** (2024), 1121–1201.
- [89] (with Freddie Manners and Terence Tao) *Sumsets and entropy revisited*, Random Structures Algorithms 66 (2025), no. 1, Paper No. e21252.
- [90] *Waring's problem with restricted digits*, 32pp, to appear in Compositio.
- [91] (with W. T. Gowers, Freddie Manners and Terence Tao) *On a conjecture of Marton*, 28pp, to appear in Ann. of Math.
- [92] (with K. Soundararajan) *Covering integers by  $x^2 + dy^2$* , 40pp, to appear in J. Inst. Math. Jussieu.
- [93] (with W. T. Gowers, Freddie Manners and Terence Tao) *Marton's Conjecture in abelian groups with bounded torsion*, 33pp, preprint, arXiv:2404.02244.
- [94] (with Mehtaab Sawhney) *Primes of the form  $p^2 + nq^2$* , 59pp, preprint, arXiv:2410.04189.
- [95] (with Mehtaab Sawhney) *Improved bounds for the Furstenberg-Sárközy Theorem*, arXiv:2411.17448.