

Sean Eberhard  
School of Mathematics and Physics  
Email: s.eberhard@qub.ac.uk



## Employment

### Visiting Scholar

School of Mathematics and Physics  
Queen's University Belfast  
Belfast, United Kingdom  
31 Aug 2024 → 31 Aug 2027

## Research outputs

Normal covering numbers for  $S_n$  and  $A_n$  and additive combinatorics  
Eberhard, S. & Mellon, C., Nov 2025, In: Bulletin of the London Mathematical Society. 57, 11, p. 3307-3325 19 p.

### Conjugacy classes of derangements in finite groups of Lie type

Eberhard, S. & Garzoni, D., 22 Apr 2025, In: Transactions of the American Mathematical Society: Series B. 12, p. 536-575 40 p.

### Diameter of classical groups generated by transvections

Eberhard, S., 01 Sept 2024, In: Journal of Algebra. 653, p. 220-256 37 p.

### Dixon's asymptotic without the classification of finite simple groups

Eberhard, S., Jul 2024, In: Random Structures and Algorithms. 64, 4, p. 1016-1019 4 p.

### Transversals in quasirandom latin squares

Eberhard, S., Manners, F. & Mrazović, R., Jul 2023, In: Proceedings of the London Mathematical Society. 127, 1, p. 84-115 32 p.

### Hamming sandwiches

Eberhard, S., 10 May 2023, (Early online date) In: Combinatorica. 24 p.

### Fusions of tensor powers of Johnson schemes

Eberhard, S. & Muzychuk, M., 03 May 2023, In: Algebraic Combinatorics. 6, 2, p. 533-538 7 p.

### The apparent structure of dense Sidon sets

Eberhard, S. & Manners, F., 24 Feb 2023, In: Electronic Journal of Combinatorics. 30, 1, #P1.33.

### Probabilistically nilpotent groups of class two

Eberhard, S. & Shumyatsky, P., 25 Jan 2023, (Early online date) In: Mathematische Annalen. 24 p.

### An asymptotic for the Hall–Paige conjecture

Eberhard, S., Manners, F. & Mrazović, R., 06 Aug 2022, In: Advances in Mathematics. 404, Part A, 108423.

### The characteristic polynomial of a random matrix

Eberhard, S., Aug 2022, In: Combinatorica. 42, 4, p. 491-527 37 p.

Babai's conjecture for high-rank classical groups with random generators

Eberhard, S. & Jezernik, U., Jan 2022, In: *Inventiones Mathematicae*. 227, 1, p. 149-210 62 p.

On symmetric intersecting families of vectors

Eberhard, S., Kahn, J., Narayanan, B. & Spirkl, S., Nov 2021, In: *Combinatorics Probability and Computing*. 30, 6, p. 899 - 904

Sharply transitive sets in  $\mathrm{PGL}_2(K)$

Eberhard, S., 01 Oct 2021, In: *Advances in Geometry*. 21, 4, p. 611-612 2 p.

Permutations with equal orders

Acan, H., Burnette, C., Eberhard, S., Schmutz, E. & Thomas, J., Sept 2021, In: *Combinatorics Probability and Computing*. p. 800 - 810

Random generation with cycle type restrictions

Eberhard, S. & Garzoni, D., 16 Feb 2021, In: *Algebraic Combinatorics*. 4, 1, p. 1-25 25 p.

Mixing time of the Chung–Diaconis–Graham random process

Eberhard, S. & Varjú, P. P., Feb 2021, In: *Probability Theory and Related Fields*. 179, 1-2, p. 317-344 28 p.

Random generation of the special linear group

Eberhard, S. & Virchow, S.-C., Jun 2020, In: *Transactions of the American Mathematical Society*. 373, 6, p. 3995-4011 17 p.

The Probability of Generating the Symmetric Group

Eberhard, S. & Virchow, S.-C., 01 Apr 2019, In: *Combinatorica*. 39, 2, p. 273-288 16 p.

Additive triples of bijections, or the toroidal semiqueens problem

Eberhard, S., Manners, F. & Mrazović, R., 25 Oct 2018, In: *Journal of the European Mathematical Society*. 21, 2, p. 441-463 23 p.

An improved lower bound for Folkman's theorem

Balogh, J., Eberhard, S., Narayanan, B., Treglown, A. & Wagner, A. Z., Aug 2017, In: *Bulletin of the London Mathematical Society*. 49, 4, p. 745-747 3 p.

Invariable generation of the symmetric group

Eberhard, S., Ford, K. & Green, B., 01 Jun 2017, In: *Duke Mathematical Journal*. 166, 8, p. 1573-1590 18 p.

Exact solutions in finite compressible elasticity via the complementary energy function

Rooney, F. & Eberhard, S., 01 Oct 2016, In: *Mathematics and Mechanics of Solids*. 21, 9, p. 1116-1125 10 p.

Permutations contained in transitive subgroups

Eberhard, S., Ford, K. & Koukoulopoulos, D., 29 Jul 2016, In: *Discrete Analysis*. 2016, 12, 36 p.

Product mixing in the alternating group

Eberhard, S., 28 Feb 2016, In: *Discrete Analysis*. 2, 2016, 18 p.

Permutations fixing a k-set

Eberhard, S., Ford, K. & Green, B., 23 Dec 2015, In: *International Mathematics Research Notices*. 2016, 21, p. 6713-6731 19 p.

Commuting probabilities of finite groups

Eberhard, S., Oct 2015, In: *Bulletin of the London Mathematical Society*. 47, 5, p. 796-808 13 p.

Følner sequences and sum-free sets

Eberhard, S., Feb 2015, In: Bulletin of the London Mathematical Society. 47, 1, p. 21-28 8 p.

Sets of integers with no large sum-free subset

Eberhard, S., Green, B. & Manners, F., 2014, In: Annals of Mathematics. 180, 2, p. 621-652 32 p.

Almost all sets of  $d + 2$  points on the  $(d-1)$ -sphere are not subtransitive

Eberhard, S., Jul 2013, In: Mathematika. 59, 2, p. 267-268 2 p.

On the ascent and descent times of a projectile in a resistant medium

Rooney, F. J. & Eberhard, S. K., 01 Jun 2011, In: International Journal of Non-Linear Mechanics. 46, 5, p. 742-744 3 p.

## **Awards**

## **Projects**