Samuel Anthony Mellick – Curriculum Vitae

Position: Adiunkt (Assistant professor) at Jagiellonian University
Previous positions: Post-dosc at McGill University (2022-2023) and École normale supérieure de Lyon (2020-2022)
Address: ul. prof. Stanisława Łojasiewicza 6, 30-348 Kraków, Poland
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Nationality: Australian

Education

- PhD in Mathematics (Summa cum laude), *Central European University*, Budapest, Hungary   2019
  Thesis title: *Point processes on locally compact groups and their cost.*
- BSc. Honours (First Class) Mathematics, *University of Queensland*, Brisbane, Australia
- BSc. Mathematics, *University of Queensland*, Brisbane, Australia

Papers

- *Exactness and the topology of the space of invariant random equivalence relations* (joint with Héctor Jardón-Sánchez, Antoine Poulin, and Konrad Wróbel), submitted
- *Unimodular random graphs with Property (T) have cost one* (Joint with Lukasz Grabowski and Hector Jardon-Sanchez), submitted
- *Indistinguishability of cells for the ideal Poisson Voronoi tessellation* (to appear in Proceedings of the AMS)
- *Gaboriau's criterion and fixed price one for locally compact groups* (to appear in Transactions of the AMS)
- *Poisson-Voronoi Tessellations and fixed price for higher rank lattices* (Joint with Mikolaj Fraczyk and Amanda Wilkens), submitted to Annals of Mathematics 08/2023, first report received 07/2025
- *On the Existence of Balancing Allocations and Factor Point Processes* (Joint with Ali Khezeli), to appear in ALEA
- *The cost of point processes* (Joint with Miklós Abért) (published in *Israel Journal of Mathematics*)
- *The Palm groupoid of a point process and factor graphs on amenable and Property (T) groups*, preprint (in progress being reworked as a survey article on measure equivalence)

Teaching Experience

Institut des Hautes Études Scientifiques

- Minicourse instructor for " *Poisson Voronoi tessellations and fixed price in higher rank*"   2025
  Five lectures, joint with Amanda Wilkens. Minicourse as part of the 2025 IHES Summer School - Discrete Subgroups of Lie Groups: Dynamics, Actions, Rigidity.   Recordings available online.

Department of Mathematics, Jagiellonian University

- Course instructor of "*Topics in Measured Group Theory*", joint with Konrad Wrobel (Graduate course) 2025

Department of Mathematics and Statistics, McGill University

- Course instructor of *MATH140 (Calculus 1)*   2022 Lecturing a section of 350 students, devising assessment.

Department of Mathematics, University of Quensland

- Mathematics Tutor and Contact Lecturer for numerous courses
  Two classes/semester, duties similar to a graduate teaching assistant in the US.

Selected Talks Given

- "Hutchcroft-Pete redux", invited speaker at conference "Orbit equivalence and topological and measurable dynamics" at Centre International de Rencontres Mathématiques   8/2025
- "Rank gradient via cost", invited speaker at IMJ-PRG summer school 2025 - Groupoids from a measurable, topological and geometric perspective   06/2025
- "The ideal Poisson Voronoi tessellation of $H^2 \times H^2$", invited speaker at conference "Probability, Dynamics, and the Geometry of Groups" at the Univeresity of Munster   09/2024
- "Cost, rank gradient, and fixed price in higher rank", invited speaker of Focused Workshop on Volume and Complexity in Non-Positive Curvature at Erdős Center (Rényi Institute)   07/2024
- "An introduction to rank gradient and cost", talk at Dynamics seminar of Jagiellonian University   11/2023
- "Fixed price one for higher rank Lie groups and some products of groups", talk at research group seminar "Actions!" of École normale supérieure de Lyon   10/2023
- "Higher rank groups have fixed price one", invited speaker at "Séminaire d'Algèbres d'Opérateurs" of Mathematics Institute of Jussieu–Paris Rive Gauche   06/2023
- "Higher rank groups have fixed price one", for the conference "Measured Group Theory, Stochastic Processes on Groups and Borel Combinatorics" at Centre International de Rencontres Mathématiques   5/2023
- "Higher rank groups have fixed price one", four-part series for research group seminar "Descriptive Dynamics and Combinatorics" of McGill University)   4/2023
- "Kazhdan groups have cost one, after Hutchcroft-Pete", two-part series for research group seminar "Descriptive Dynamics and Combinatorics" of McGill University)   10/2022
- "Computing the cost on nondiscrete groups with factors of IID ", research group seminar "Groups and Dynamics online" of University of Texas at Austin)   4/2022
- "Visualising actions, computing cost, and fixed price for G x Z", research group seminar "Descriptive Dynamics and Combinatorics" of McGill University)   2/2022
- "The cost of point processes", invited guest of "DYOGENE Project" of Centre Inria de Paris   2/2022
- "Point processes on groups, their cost, and fixed price for G x Z", talk at research group seminar "Ergodic and Geometric Group Theory" of École Polytechnique Fédérale de Lausanne   5/2021
- "Point processes on groups, their cost, and fixed price for G x Z", talk at research group seminar "Group actions" of UC San Diego   3/2021
- "Point processes on groups, their cost, and fixed price for G x Z", at Institut de Mathématiques de Jussieu-Paris Rive Gauche as part of the Séminaire d'Algèbres d'Opérateurs   9/2020
- "The cost of point processes", at Alfréd Rényi Institute of Mathematics as part of the Kutszem (weekly seminar of the *Groups and Graph Limits* research group)   3/2019
- "Point processes on nondiscrete groups as pmp actions", at Instituto de Ciencias Matemáticas (Madrid, Spain) as part of thematic program *L2-invariants and their analogues in positive characteristic*   3/2018