Jonathan Peter Taylor, PhD

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EDUCATION

Bachelor of Mathematics and Computer Science,
University of Wollongong, Wollongong, Australia, transferred to Bachelor of Mathematics in June 2017

Bachelor of Mathematics
University of Wollongong, Wollongong, Australia, transferred from Bachelor of Mathematics and Computer science, completed in July 2018

Bachelor of Mathematics (Honours), University of Wollongong, Wollongong, Australia, complete July 2019
Thesis title: Graded K-homology for graph C^*-algebras.
Primary Supervisor: Snr. Prof. Aidan Sims
Co-supervisor: Dr. Adam Sierakowski

Doctorate of Mathematics (PhD),
Georg-August-Universität Göttingen, Göttingen, Germany
Completed magna cum laude September 2022
Thesis topic: Aperiodic dynamical inclusions of C^*-algebras.
Primary Supervisor: Prof. Dr. Ralf Meyer

EMPLOYMENT

Doctoral Candidate, University of Göttingen
October 2019 – September 2022

Postdoctoral Researcher (Akademischer Mitarbeiter), University of Göttingen
October 2022 – September 2023

Postdoctoral Researcher (Akademischer Mitarbeiter), University of Potsdam
October 2023 – Present

RESEARCH INTERESTS

I am broadly interested in C^*-algebras arising from algebraic objects and dynamical systems, as well as the broader category theoretic structures surrounding them. Some more specific interests include:

- analysis and classification of inclusions of C^*-algebras;
- Fell bundles over étale non-Hausdorff groupoids and their C^*-algebras;
- inverse semigroup actions and their crossed products, noncommutative dynamical systems;
- geometric semigroup theory and non-commutative Stone duality;
- functoriality for C^*-algebra constructions.

My previous research projects focus heavily on the analysis of groupoid C^*-algebras, including classifying inclusions of regular maximal commutative C^*-subalgebras (called essential Cartan inclusions) with detection of ideals as groupoid C^*-algebras. This expands upon the results of Renault and Kumjian using a different approach to Exel and Pitts with different advantages.

Another major project was describing morphisms between étale groupoids that induce *-homomorphisms between the C^*-algebras of the groupoids. This research frames entwining of conditional expectations and injectivity of the induced homomorphisms on the level of groupoids, as well showing that all homomorphisms between essential Cartan pairs that preserve the Cartan structure must arise from morphisms between the underlying groupoids.

PUBLICATIONS

Q. Patterson, A. Sierakowski, A. Sims, J. Taylor, *Graded K-theory and K-homology of relative Cuntz–Pimsner algebras and graph C^*-algebras*, Journal of Mathematical Analysis and Applications **496**, Issue 2 (2021).

R. Meyer, A. I. Raad, J. Taylor, *Inductive limits of noncommutative Cartan pairs*, Proc. Amer. Math. Soc. **152** (2024), 337-344

J. Taylor, *Essential commutative Cartan subalgebras of C^*-algebras*, (arXiv:2206.09634 [math.OA]) (2022)

J. Taylor, *Aperiodic dynamical inclusions of C^*-algebras*, (arXiv:2303.10905 [math.OA]) (2023)

J. Taylor, *Functoriality for groupoid and Fell bundle C^*-algebras*, (arXiv:2310.03126 [math.OA]) (2023)