Tobias Boorman | Curriculum Vitae

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Personal Overview

Having graduated from Lancaster University with a first-class MSci (Hons) in Theoretical Physics with Mathematics, I am now a PhD student in the School of Physics and Astronomy at the University of St Andrews, working under the supervision of Dr Bernd Braunecker in the field of quantum dynamics in strongly correlated systems.

My work with Dr Braunecker is theoretically rich, involving ventures into topics such as finite temperature quantum field theory and quantum thermodynamics, as well as the underlying theories of Luttinger liquids and quantum measurement and control necessary for specific aspects of my research.

Through my work I have gained considerable programming experience, using languages such as C++, Python, R, and Mathematica for numerical simulations (both local and with supercomputers) and data-analysis. However, analytics is the main driver of my work, requiring in particular a deep understanding of complex analysis and measurement theory.

I also have gained experience in co-supervising summer project students, in the fields of dissipative quantum dynamics and relativistic quantum mechanics. Indeed, experience gained in the PhD is not exclusively technical, requiring management capability in organising seminars, confident communication in teaching or giving talks at conferences, and even strong team-working ability gained from regular whiteboard sessions with colleagues.

Education and Qualifications

PhD Theoretical Physics, The University of St Andrews (2020-2024)

MSci Hons Theoretical Physics with Mathematics (1^{st}), Lancaster University (2016-2020)

Publications

Diagnostics of entanglement dynamics in noisy and disordered spin chains via the measurement-induced steady-state entanglement transition - Phys. Rev. B 105, 144202 (2022)

Conference Presentations

IOP Condensed Matter and Quantum Materials, online, 2021

IOP General Conference of the Condensed Matter Division of the European Physical Society, 2022

DPG Spring Meeting of the Condensed Matter Section, Dresden, 2023

Scottish Universities Physics Alliance Graduate School Modules

Modern Topics in Condensed Matter Theory, Martinmas semester 2020

Quantum Field Theory, Martinmas semester 2020

Software Carpentry, Candlemas semester 2022

Organised Seminar Series

Quantum Information Scotland Network Seminars, 2020-2021

St Andrews Theory Discussion, 2022-2023

Teaching and Marking

Quantum Mechanics 1, Martinmas semester 2021

Lagrangian and Hamiltonian Dynamics, Candlemas semesters 2022 and 2023

References

Available upon request