Tobias Boorman | Curriculum Vitae

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Personal Overview

Having graduated from Lancaster University with a first-class MSci 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 strongly correlated materials.

My work with Dr Braunecker is concerned with studying the joint-coherent dynamics of an impurity spin embedded within a strongly interacting environment, resulting from the onset of temporal correlations. These non-Markovian effects occur over sub-thermal timescales, and our work has been specifically focused on providing a description of how the free-induction decay amplitude of the impurity spin is shifted with the tuning of intra-bath interaction and applied magnetic field strengths. Having completed this study for the Luttinger liquid, we are now branching out to study more exotic systems.

Extending my Masters thesis research, my co-authors, Dr Marcin Szyniszewski, Dr Alessandro Romito, Professor Henning Schomerus, and I have completed a study on the competition between processes that facilitate and impede the spread of entanglement in one-dimensional quantum circuit systems. As of writing, our paper has been accepted by Physical Review B.

Publications

Diagnostics of entanglement dynamics in noisy and disordered spin chains via the measurement-induced steady-state entanglement transition

PRB Link: https://tinyurl.com/2fehsf94

Publication preprint: https://arxiv.org/abs/2107.11354

Teaching

Undergraduate Quantum Mechanics 1, Martinmas semester 2021

Conference Attendance

IOP Condensed Matter and Quantum Materials, 2021

My presentation: https://youtu.be/tBsqLMA4f7Y?t=4115

IOP Bound states in hybrid superconductor nanostructures, 2021

Organised Seminar Series

Quantum Information Scotland Network Seminars, 2020-2021

Scottish Universities Physics Alliance Graduate School Modules

Modern Topics in Condensed Matter Theory, Martinmas semester 2020

Quantum Field Theory, Martinmas semester 2020

Education and Qualifications

The University of St Andrews

PhD Theoretical Physics, 2020-2024

Lancaster University

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

References

Dr Bernd Braunecker
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