Méabh I. L. Allen

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Education

University of California, Berkeley — Berkeley, USA
PhD candidate in Physics — *Jan. 2022 - Present*

Imperial College London — London, UK
M.Sc. in Quantum Fields and Fundamental Forces — *Oct. 2020 - Oct. 2021*

Technical University of Munich — Munich, Germany
Erasmus Scholar — *Oct. 2018 - Sep. 2019*

University College Cork — Cork, Ireland
Joint First Class Honours B.Sc. in Mathematics and Physics — *Sep. 2016 - May 2020*

Awards

NSF Challenge Institute for Quantum Computation (CIQC) Seed Funding	2024
UC Berkeley Leo Falicov Fellowship	2023
Heising-Simons Fellowship	2022
Tyndall National Institute IPIC Fellowship	2020
Erasmus Exchange Scholarship	2018
Quercus Scholarship for Top National State Examination Result	2015

Research Experience

PhD Thesis — Jan. 2022 – Present
Prof. Joel Moore — *University of California, Berkeley*
Non-equilibrium many-body dynamics of quantum critical systems.

Masters Dissertation — May 2021 – Oct 2021
Prof. Arttu Rajantie — *Imperial College London*
"The Kosterlitz-Thouless phase transition in spin models and quantum field theory."

Summer Internship — May. 2020 – Aug. 2020
Dr. Stefan Schulz — *Tyndall National Institute, Ireland*
"Modelling the temperature dependence of photoluminescence properties of disordered AlGaN quantum wells for ultraviolet light emission: a kinetic Monte Carlo study."

Bachelors Thesis — Jan. 2020 – May 2020
Prof. Stephen Fahy — *University College Cork*
"Surface vibrational modes in Bi2Te3 & Bi2Se3, two layered topological insulators."

Presentations and publications

J. Wei, MILA, C. Wang, J. Kemp, J. Moore, N. Yao, "Shallow Global Quenches in Critical Spin Chains," *in preparation.*

MILA, G. Woolls, C. Wächtler, J. Moore, "Cat State Preparation in a Driven-Dissipative Critical Spin Chain," *in preparation.*

MILA and Oriana Diessel, "Novel Short-Time Universality for Critical Quenches in Non-Equilibrium Phase Transitions," *in preparation.*

MILA, "Kibble-Zurek Dynamics vs Dissipation in Critical Spin Chains," *APS Global Summit* (Mar 2025).

MILA, "Correlations Induced by Quench Protocols in Critical Spin Chains," *APS March Meeting* (Mar 2024).

J. A. Sobota et al., "Influence of Local Symmetry on Lattice Dynamics Coupled to Topological Surface States," *Phys. Rev. B, 107, 014305* (Jan 2023).

Y. Huang et al., "Ultrafast Measurements of Mode-Specific Deformation Potentials of Bi2Te3 and Bi2Se3," *Phys. Rev. X, 13(4), 041050* (Dec 2023).

Outreach Experience

CIQC Delegate | *NSF Quantum Showcase, NSF Headquarters and Capitol Hill* Apr. 2024

Represented the CIQC with Director Dan Stamper-Kurn in meeting with leaders from across the NSF Directorates, with Members of Congress, Congressional staffers, and NSF Director Sethuraman Panchanathan.

Organizing Committee | *CIQC, UC Berkeley* Jan. 2023 - Present

Leadership role planning seminars, networking events, and journal clubs for the cross-departmental quantum-computing community on campus.

Graduate Mentor | *MPS and COMPASS Mentoring Programs, UC Berkeley* Aug. 2022 - Present

Mentorship role with math and physics majors from underrepresented backgrounds, providing guidance regarding STEM, undergraduate life, research, and career planning.

Founding Committee Member | *EPONA, University College Cork* Sep. 2019

Equal Physics Opportunities Network in Academia network aimed at promoting gender equality and inclusivity within the physics department and community through workshops, seminars and outreach.

Organizing Committee | *Physics and Astronomy Club, University College Cork* Sep. 2017 - May 2020

Leadership role in organization of educational and social events.

Teaching Experience

Graduate Student Instructor | *Physics 141B, UC Berkeley* Jan. 2024 - May 2024

Teaching assistant for an upper-level condensed matter course for Physics majors.

Graduate Student Instructor | *Physics 7A, UC Berkeley* Aug. 2023 - Dec. 2023

Teaching assistant for an introductory course on mechanics for beginning engineers.

Undergraduate Student Instructor | *Physics 2106, University College Cork* Jan. 2020 - May. 2020

Teaching assistant for an astrophysics and special relativity course for Physics majors.

Technical Skills

Programming

Nine years of coursework and research in Python and Mathematica. Tensor networks with the Python library TeNPy and the Julia library ITensor. Molecular dynamics with C/C++, Monte Carlo simulations with MATLAB.

Languages

CEFR C1 German speaker, CEFR B2 French speaker, native Irish speaker.

Graduate-level Coursework

Special topics in many-body physics, non-equilibrium statistical physics, quantum field theory, quantum electrodynamics, advanced quantum field theory, unification, particle symmetries, quantum theory of matter, quantum information, differential geometry.

Extracurricular

Volunteer Assistant Trainer | *Kheystone Stables, Oakland* 2023 - Present

Equestrian training and rehabilitation program.

Founder & Co-Director | *Munster Schools Integrated Oratory Competition, Ireland* 2016 - 2018

Debating competition for high schools throughout the region.