Dr. P. M. Secular

"Paul defended his work exceptionally well. His profound understanding of quantum mechanics was evident throughout. Paul's contributions in Part III [of his thesis] are both substantial and innovative."

— PhD *viva voce* examiners' feedback

CONTACT

Email	p.m.secular@bath.edu
Web	https://secular.me.uk/
Languages	English (fluent), Italian (limited working proficiency)

EDUCATION

Doctor of Philosophy (PhD), Mathematics & Physics — **2016–2024**
University of Bath

Doctoral thesis: Parallel Tensor Network Methods for Quantum Lattice Systems.
Awarded Edward Fraenkel Prize for best thesis of 2024 in the Department of Mathematical Sciences.
Collaborated with Prof. Jaksch's group at the University of Oxford on the Tensor Network Theory (TNT) Library project. Gave talks at seminars/symposia and presented posters at conferences.
Took Advanced Quantum Theory via mathematics Taught Course Centre (grade: Distinction).

Master in Science (MSci), Physics with Theoretical Physics — **2012–2016**
Imperial College London

MSci project: Nonlocality & Impossible Machines (grade: 80%).
First-year pair project: "Recovering Chaotic Systems using Genetic Algorithms" (grade: 92%).
Options taken include Complexity & Networks, Computational Physics, Foundations of Quantum Mechanics, General Relativity, Information Theory, and Quantum Information.
Mentored five undergraduate students.

Certificate of Higher Education (CertHE), Physics & Mathematics — **2011–2012**
Birkbeck College, University of London

Studied part-time to refresh academic skills, achieving 100% in Mathematics and 99% in Physics.
Essay project: "Re-examining radioactive decay: a rigorous approach" (grade: Distinction).

FUNDING

High Performance Computing PhD studentship — **2016–2020**
University of Bath / ClusterVision

2019 Quantum Information Theory research term grant — **2 weeks**
The Instituto de Ciencias Matemáticas (ICMAT), Madrid

2016 High Performance Computing Autumn Academy bursary — **2 weeks**
HPC-SC Consortium

WORK EXPERIENCE

Graduate Teaching Assistant **2016–2024**
University of Bath (zero-hours contract)

Assisted/tutored physics and mathematics undergraduates in the following courses: Programming for Applied Mathematics (2023–24), Scientific Computing (2018–19), Mathematical Methods for Physics (2017–18), Programming Skills for Mathematics & Physics (2017–18), Computational Physics B (2016–17). Marked programming coursework and provided constructive feedback.

Undergraduate Research Opportunities Programme (UROP) **2014–2015**
Imperial College London (part-time)

Worked with Dr. Caroline Clewley to design and build an interactive, educational web application in JavaScript aimed at first-year Physics undergraduates studying Special Relativity.

Web Developer **2008–2010**
Freelance (part-time)

Designed and built e-commerce websites and blogs for two independent fashion boutiques.

Software Analyst/Developer **2002–2007**
YouthNet (full-time)

Worked on the National Volunteering Database project as lead developer of V-Base—a desktop application used by the UK's Volunteer Centre network, Sport England, Business In The Community, and others. Undertook and presented research on IT infrastructure in the Voluntary and Community sector. Recruited and supervised one contractor and several volunteers.

PAPERS

Classical verification of a quantum simulator: local relaxation of a 1D Bose gas
P. Secular, arXiv.2401.05301 (2024)

The addition of relativistic velocities from the k-calculus (letter to editor)
P. Secular, *The Physics Teacher*, 59(2):84 (2021)

Comment on "Relaxation theory for perturbed many-body quantum systems versus numerics and experiment", P. Secular, arXiv:2005.02681 (2020)

Parallel time-dependent variational principle algorithm for matrix product states
P. Secular, N. Gourianov, M. Lubasch, S. Dolgov, S. R. Clark, and D. Jaksch
Physical Review B, 101(23):235123 (2020)

COMMUNITY REVIEW

FAIR Principles for Research Software version 1.0 (FAIR4RS Principles v1.0)
N. P. Chue Hong, D. S. Katz, M. Barker, et al. *Research Data Alliance* (2022)