

# Mr Paul Secular

MSci ARCS

## CONTACT

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## EDUCATION

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**Doctor of Philosophy (PhD) in Mathematics and Physics** **2016–2024**  
*University of Bath*

Awaiting examination. Thesis: “Parallel tensor network methods for quantum lattice systems” supervised by Sergey Dolgov (University of Bath) and Stephen R. Clark (University of Bristol).  
Submitted on 31/12/2023 (original date delayed due to personal leave during COVID-19 pandemic).  
Took Advanced Quantum Theory module from mathematics Taught Course Centre (grade: 87%).

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

MSci project: “Nonlocality & Impossible Machines” (grade: 80%) supervised by David Jennings.  
Modules included: Advanced Particle Physics, Complexity & Networks, Computational Physics, Foundations of Quantum Mechanics, General Relativity, Information Theory, Quantum Information.  
1st year pair project: “Recovering Chaotic Systems using Genetic Algorithms” (grade: 92%).

**Certificate of Higher Education in Physics & Mathematics** **2011–2012**  
*Birkbeck College, University of London*

## VOLUNTEERING

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**PhD student mentor (for one student)** **2017–2018**  
*University of Bath*

**Undergraduate student mentor (for five students)** **2013–2015**  
*Imperial College London*

## FUNDING

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

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

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

## WORK

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### Graduate Teaching Assistant

2016–2023

*University of Bath, part-time*

Assisted undergraduate students in problem classes and computing labs: Programming for Applied Mathematics (2023), Scientific Computing (2018-19), Mathematical Methods for Physics (2017-18), Programming Skills for Mathematics & Physics (2017-18), Computational Physics B (2016-17).

### UROP Software Developer

2014–2015

*Imperial College London, part-time*

Developed an interactive, educational web application aimed at 1st year students of Special Relativity. Project funded by Imperial's Undergraduate Research Opportunities Programme (UROP).

### 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. This software was used by the UK's Volunteer Centre network, Sport England, and Business In The Community. Undertook and presented research on IT infrastructure in the Voluntary and Community sector.

### Software Engineer

2000–2002

*Cognition Consulting, full-time*

Designed and developed a bespoke content management system for Global Continuity and worked with other developers on risk-management database applications.

## COMPUTING

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### Procedural and object-oriented programming

C, Python, MATLAB, JavaScript, Visual Basic .NET

### Parallel programming and scientific computing

MPI, OpenMP, NumPy, BLAS, LAPACK

### Relational database and web design

SQL Server, MS Access, HTML, CSS

### Version control, debugging, and unit testing

Git, Subversion, Arm DDT, Arm Map, Visual Studio, NUnit

## PAPERS

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### Classical verification of a quantum simulator: local relaxation of a 1D Bose gas

P. Secular, *preprint* (2024) <https://doi.org/10.48550/arXiv.2401.05301>

### 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, 235123 (2020) <https://doi.org/10.48550/arXiv.1912.06127>

## LANGUAGES

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English (fluent), Italian (conversational)