

Profile

A versatile physics PhD student looking for opportunities to apply analytical and research skills to the solution of real-world problems.

Academic background

- 2014 - present **PhD in Physics, University of Cambridge**
- Created, developed, and maintained two complementary techniques to accelerate (by a factor of 2000) and streamline numerical simulations using a popular Quantum Monte Carlo program.
 - Undertook the ground-up investigation, using both **analytical methods** and custom-built **numerical techniques**, of a novel type of superconductivity.
 - **Independently** developed an efficient, parallelised Path Integral Monte Carlo program for studying quasicrystals.
 - Numerical solutions primarily in **Mathematica**, with some use of Fortran on top of an existing code-base.
 - Gave several well-received talks on my research, and presented a poster at four international conferences.
 - Supervised groups of undergraduate students each year, planning and tailoring sessions to the individual students' needs.
 - Created supervision resources, including mock exams, also used by other supervisors to support their students.
 - Jointly supervised Part III (undergraduate Master's degree) students each year as they undertook their final year research projects, developing my **project leadership** skills.
- 2010 - 2014 **MPhys in Physics – First Class, University of Oxford**
- Fourth year major options in Condensed Matter Physics and Theoretical Physics.
 - Research project focussed on the dynamics of active microtubules, using code I wrote in C.
- 2003 - 2010 **Oxted School**
- A Levels: Physics A*, Mathematics A*, Further Mathematics A*, History A, German A.

Relevant Skills

- **Mathematics:** Well versed in a variety of exact and approximate methods, including calculus, differential equations, linear algebra, and dimensional analysis.
- **Programming:** Recently primarily in Mathematica, including differential equation solving, code optimisation, and parallel computing. Previously used C and Fortran, and some self-taught experience with Python.
- **IT:** Proficient with Microsoft Office and LaTeX. Experienced in both Windows and Linux environments, including gnuplot and shell scripting. Used Blender and Mathematica to create publication-quality graphics.
- **Languages:** First language English; reasonable written and spoken German.

Employment History

- June 2013 – September 2013
- Summer Placement Student at the Met Office, Exeter**
- Analysed discrepancies between the Met Office’s predictions of low-frequency turbulence from their atmospheric-dispersion numerical model and observations.
 - Part of the team that used these differences to parametrise a model of low-frequency turbulence that is now implemented in the Met Office’s model.
 - Successfully completed project and technical report in three months.
- 2012 - 2013
- Private Tutor**
- Self-employed tutoring of GCSE and A Level students in mathematics and physics.
 - Developed strategies to respond to the requirements of individual students, working **flexibly** to best suit their needs.
- 2011 - 2013
- Oxbridge Applications**
- Worked as part of a **team** of tutors, providing a combination of small-group tutoring and interview practise to sixth-form students.
 - Travelled around the country to provide targeted services at diverse types of schools.
- 2007 - 2010
- Voluntary work with the National Trust**
- At Chartwell, the home of Sir Winston Churchill, assisting visitors to the property.

Publications

- *Jastrow correlation factor for periodic systems*, T.M. Whitehead, M.H. Michael, and G.J. Conduit, Physical Review B **94**, 035157 (2016).
- *Pseudopotential for the two-dimensional contact interaction*, T.M. Whitehead, L.M. Schonenberg, N. Kongsuwan, R.J. Needs, and G.J. Conduit, Physical Review A **93**, 042702 (2016).
- *Pseudopotentials for an ultracold dipolar gas*, T.M. Whitehead and G.J. Conduit, Physical Review A **93**, 022706 (2016).
- *Multi-particle instability in a spin-imbalanced Fermi gas*, T.M. Whitehead and G.J. Conduit, under review.
- *Parametrizing unresolved mesoscale motions in atmospheric dispersion models*, H.N. Webster, T.M. Whitehead, and D.J. Thomson, under review.

Referees

Available upon request.