Dr. George William Stagg

Curriculum Vitae

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Personal Data

Date and Place of Birth:	24 November 1989 — United Kingdom
Current Home Address:	7 Bedale Drive, Whitley Bay, Tyne & Wear, NE25 8UR
Current Work Address:	School of Mathematics, Statistics & Physics, Herschel Building, Newcastle University, NE1 7RU
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Education

June 2016 **Doctor of Philosophy - Mathematics**, Newcastle University
Thesis Title: "A Numerical Study of Vortices and Turbulence in Quantum Fluids"
Supervisors: Prof. Carlo Barenghi & Dr. Nick Parker

July 2012 **MMath - Mathematics**, Newcastle University
First Class Honours
Project Title: "The Movement of a Fractal Through a Bose-Einstein Condensate"
Supervisor: Prof. Carlo Barenghi

Work Experience

2016–current | Teaching & Research Technical Officer at Newcastle University

Responsible for supporting mathematical computing in the School of Mathematics, Statistics & Physics. Responsibilities include the authoring of e-learning material, research software engineering, production and maintenance of School web services, computational support for academic staff and postgraduate researchers, and the delivery of short courses and tutorials.

Part of the role is to support system administration of *Topsy*, the SAgE Faculty High Performance Cluster (HPC). The support includes single-thread to multi-node software engineering, low level systems programming, hardware maintenance and troubleshooting, and the compilation, installation and configuration of HPC system software.

2012–2016 | Postgraduate Researcher at Newcastle University

PhD research based on modelling quantum turbulence in superfluids through numerical simulation of the Gross-Pitaevskii equation. Along with strong academic ability, the role required good inter-personal skills due to the need for academic collaboration and the communication of postgraduate level research to experts and a more general scientific audience.

2012–2015 | Undergraduate Assignment Marker/Assisting at Newcastle University

Responsible for marking undergraduate assignments for various modules in the School of Mathematics & Statistics at Newcastle University. Responsibilities also included the teaching of undergraduate level mathematics to students who required assistance in tutorials or computer practicals.

Skills Summary

Research	Over 4 years academic experience in mathematical and physical research, including computational mathematics, fluid dynamics, numerical analysis and data visualisation.
Programming	Extensive knowledge of programming with Fortran and Matlab, and experience of parallel programming with OpenMPI & OpenMP. Adept at writing publication-quality documents with LaTeX. Knowledge and experience of working with C/C++, R, Python, Bash scripting, and building web materials with HTML, Javascript, PHP, and mySQL technologies.
IT Skills	Familiar with several operating systems including Microsoft Windows, OS X, and GNU/Linux, with particular expertise in GNU/Linux systems. Heavily used HPC various systems in the past, and familiar with the queue management tools Grid Engine and PBS. Experience administrating a HPC system using Rocks Linux with Grid Engine. Proficient with the Git/Github version management tools and familiar with GNU Autotools, Makefiles and Unix shell scripting.
General	Proven public speaking, collaboration, and communication skills. Fast learner with excellent problem solving skills, enthusiastic and hard working individually or in a team. Good time management skills, working efficiently to deadlines.

Personal Interests & Projects

Technology, systems and website programming, video game design, iOS reverse engineering/runtime modification, photography. Personal projects include the development of free and open source materials in a variety of areas:

- 2D-GP, and 3D-GP-MPIMP — parallel, HPC-aware Fortran projects actively used to mathematically simulate Bose-Einstein condensates.
- Co-developer of Graph Curvature Calculator, a mathematical tool for calculating the Bakry-Emery curvature of graphs.
- Creating hobbyist mathematical demos and video games playable on the web & iOS devices. For example:
  - Primes
  - Double Spherical Pendulum
  - Tensor Tic-Tac-Toe

References

Available on request.

Further Academic Information

Teaching Experience

Oct/Nov 2017	Introduction to Mathematical Typesetting with LaTeX, Newcastle University
Oct 2017	R/Matlab Refresher Sessions, Newcastle University
Oct/Nov 2016	Introduction to LaTeX, Newcastle University

Scholarships and Awards

2012–2016	Doctoral Training Grant, EPSRC
July 2012	Best Applied MMath Project, Newcastle University

Research Publications

2018	The Graph Curvature Calculator and the curvatures of cubic graphs D. Cushing, R. Kangaslampi, V. Lipiäinen, S. Liu, G. W. Stagg, *In preparation*
May 2017	Vortex scattering by impurities in a Bose-Einstein condensate A. Griffin, G. W. Stagg, N. P. Proukakis and C. F. Barenghi, J. Phys. B: At. Mol. Opt. Phys. **50**, 115003
Mar 2017	Superfluid boundary layer G. W. Stagg, N. G. Parker, C. F. Barenghi, Phys. Rev. Lett. **118**, 0135301
Nov 2016	Ultraquantum turbulence in a quenched homogeneous Bose gas G. W. Stagg, N. G. Parker, and C. F. Barenghi, Phys. Rev. A **94**, 053632
Feb 2016	Critical velocity for vortex nucleation in a finite-temperature Bose gas G. W. Stagg, R. W. Pattinson, C. F. Barenghi, N. G. Parker, Phys. Rev. A **93**, 023640
Jan 2015	Generation and Decay of Two-Dimensional Quantum Turbulence in a Trapped Bose-Einstein Condensate G. W. Stagg, A. J. Allen, N. G. Parker, and C. F. Barenghi, Phys. Rev. A **91**, 013612
May 2014	Quantum analogues of classical wakes in Bose-Einstein condensates G. W. Stagg, N. G. Parker and C. F. Barenghi, J. Phys. B: At. Mol. Opt. Phys. **47**, 095304

Conference Proceedings Publications

Aug 2015	Motion of quantum vortex lines near realistic rough boundaries G. W. Stagg, N. G. Parker, and C. F. Barenghi, ETC15, Delft 2015
Mar 2015	Classical-like wakes past elliptical obstacles in atomic Bose-Einstein condensates G. W. Stagg, A. J. Allen, N. G. Parker, and C. F. Barenghi, J. Phys.: Conf. Ser. **594**, 012044

Conference and Seminar Presentations

Apr 2016 Superfluid Seminar - **Newcastle University**
Speaker - Ultraquantum decay in a non-equilibrium Bose gas &
Superfluid boundary layer near a rough surface

Dec 2015 Superfluid Seminar - **Newcastle University**
Speaker - Critical velocity for vortex nucleation at T>0

Aug 2015 Young Researchers in Mathematics - **Oxford University**
Speaker - Classical-like wakes in atomic Bose-Einstein condensates

July 2015 Non-equilibrium Quantum Dynamics in Low Dimensions - **Durham University**
Poster - Generation and decay of two-dimensional quantum turbulence in a trapped BEC

Nov 2014 APS Physics - DFD - **Stanford / Berkeley / Santa Clara University**
Speaker - Quantum analogues of classical wakes in Bose-Einstein condensates

Sept 2014 QuAMP: Summer School - **Durham / Newcastle University**
Poster - Generation and decay of two-dimensional quantum turbulence in a trapped BEC

Aug 2014 SIAM: Nonlinear Waves and Coherent Structures - **University of Cambridge**
Speaker - Quantum analogue of classical wakes in Bose-Einstein condensates

June 2014 Turbulence In Quantum Fluids - **University of Glasgow**
Speaker - Superfluid flow around elliptical obstacles and rough surfaces
Poster - Classical-like wakes in two-dimensional Bose-Einstein condensates

Nov 2013 Applied Mathematics Internal Seminar Series - **Newcastle University**
Speaker - Flow around obstacles in a quantum fluid