Malcolm Roberts — Curriculum Vitae

Contact Information
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Education

PhD in Applied Mathematics, **University of Alberta**, 2011
MSc in Applied Mathematics, **University of Alberta**, 2006
BSc, Honors Applied Mathematics, **University of Alberta**, 2001

Work history

Postdoctoral Researcher, **Institut de Recherche de Mathématique Avancée**, Université de Strasbourg, France, since 2014.

- Implement a discontinuous Galerkin solver in `OpenCL` to numerically solve general hypterbolic conservation laws using `CPU`s, `GPU`s, and `MIC`s.
- Publish articles in peer-reviewed publications and present results at international conferences.

Postdoctoral Researcher, **Laboratoire de Mécanique, Modélisation et Procédés Propres**, Aix-Marseille University, France, 2012 to 2014.

- Design software for simulating magneto-hydrodynamic turbulence in a grid computing environment using spectral methods and penalisation.

Sessional Lecturer, **University of Alberta**, Canada, 2010.

- Lectured differential equations in a team-teaching environment.

Graduate Student, **University of Alberta**, Canada, 2003 to 2011.

- Develop a coherent research program in applied mathematics.
- Write papers and present results at international conferences.
- Teach undergraduate math labs and help sessions.

English Teacher, Private Academy, South Korea, 2003 to 2004.

Undergraduate Researcher, **University of Alberta**, 1998 to 2000.

Peer-Reviewed Articles

Self-organisation of helicaly forced MHD flows in confined cylindrical geometries, with M. Leroy, J. Morales, W. Bos, and K. Schneider. Fluid Dynamics Research, (2014).

Adaptive Matrix Transpose Algorithms for Distributed Multicore Processors, with John C. Bowman. Springer Proceedings of the Applied Mathematics, Modelling and Computational Science, (2013).

Multithreaded Implicitly Dealiased Pseudospectral Convolutions, with John C. Bowman. Proceedings of the 20th Annual Conference of the CFD Society of Canada (2012)

Pseudospectral Reduction of Incompressible Two-Dimensional Turbulence, with John C. Bowman. Communications in Nonlinear Science and Numerical Simulation **17:5**, 2008-2013 (2012)

Dealiased Convolutions for Pseudospectral Simulations, with John C. Bowman. Proceedings of the 13th European Turbulence Conference (2011)

Efficient Dealiased Convolutions without Padding, with John C. Bowman. SIAM Journal on Scientific Computing, **33:1**, 386-406 (2011)

Links between dissipation, intermittency, and helicity in the GOY model revisited, with John C. Bowman, Charles R. Doering, Bruno Eckhardt, Jahanshah Davoudi, and Jörg Schumacher. Physica D **218**, 1-10 (2006)

Other Publications

Lab Manual for Math 201: Differential Equations for Engineers, with S. Marion (2011)

`FFTW++`: *Fast Fourier Transform `C++` Header Class for FFTW3*, with John C. Bowman. `fftwpp.sourceforge.net`, (2010)

`schnaps`: *An `OpenCL` discontinuous Galerkin solver*, with P Helluy et al. `schnaps.gforge.inria.fr`, (2015)

Volunteering & Committees

Thousand Faces Performance Art Festival
- President of the Board 2011 to 2013

PIMS Mathematical and Statistical Graduate Education Round table
- Brought together faculty, students, and administration from seven universities.
- Resulted in new policies and programs being implemented.

Canadian Young Researchers Conference in Mathematics and Statistics
- Organising Committee (2006, 2008, 2010)

Volunteer Mechanic/Instructor, Edmonton Bicycle Commuter's Association, 2009 to 2013, Collectif Vélos en Ville, 2012 to 1013

University of Alberta Math and Stat Grad Association
- President 2005 to 2006, Treasurer 2006 to 2007

University of Alberta Math Fair and Math Outreach, 2004 to 2011

Technical Skills

Project management and public speaking.
`C++`, `C`, `OpenCL`, `Python`, and `FORTRAN`, using `OpenMP` and `MPI`.
Linux scripting, version control systems, grid computing environments.
Data analysis and visualization: LaTeX, Asymptote, HDF, and Paraview.