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 Information [malcolmiwroberts.com](http://malcolmiwroberts.com)

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

Work History Postdoctoral Researcher, **IRMA**, Université de Strasbourg, France, since 2014.

- Implement a discontinuous Galerkin solver in **OpenCL** to numerically solve general hyperbolic conservation laws using CPUs, GPUs, and MICs.
- Present at conferences and published in peer-reviewed journals.

Postdoctoral Researcher, **M2P2**, Aix-Marseille University, France, 2012 to 2014.

- Designed software for simulating magneto-hydrodynamic turbulence in a grid computing environment using spectral methods and penalisation.
- Presented at conferences and published in peer-reviewed journals.

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

- Lectured differential equations in a team-teaching environment.

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

- Developed a coherent research program in applied mathematics.
- Presented at conferences and publish articles in peer-reviewed journals.
- Ran undergraduate math labs and help sessions.

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

Selected Projects **fftw++** ([fftwpp.sf.net](http://fftwpp.sf.net)).

- Implementation of implicitly dealiased convolutions:
  - Twice as fast and half the memory.
  - Applications to image processing, machine learning, simulations.
- MPI/OpenMP implementation of FFTs and convolutions for grid computing.
- Resulted in 5 publications and several conference presentations so far.
- Over 11 000 downloads.

**schnaps** ([schnaps.gforge.inria.fr](http://schnaps.gforge.inria.fr)).

- A discontinuous-Galerkin solver for general numerical simulations.
- Written in C and **OpenCL**. Runs on CPUs, GPUs, and MICs.
- Resulted in 1 publication and several conference presentations so far.

Subgrid models for turbulence.

- Technique for simulating fluid flows with reduced computational cost.
- Subject of my doctoral and masters dissertations.

Skills Collaboration and project management.  
 Public speaking and scientific writing. Proficient in English and French.  
 Expertise in mathematical modelling and high-performance computing.  
 Knowledge of dynamical systems, numerical methods, and statistics.  
 I program in C++, C, **OpenCL**, Python, and FORTRAN, using **OpenMP** and **MPI**.  
 Linux scripting, version control, grid computing environments.  
 Data analysis and visualization: **L<sup>A</sup>T<sub>E</sub>X**, R, **Asymptote**, and Paraview.