

Contact Information	<code>malcolm.i.w.roberts@gmail.com</code> <code>malcolmiwroberts.com</code>
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	Simulation Scientist, Computer Modelling Group , since 2016. <ul style="list-style-type: none">• Tasked with improving the performance of a large-scale commercial reservoir simulator written in C# and C++. Postdoctoral Researcher, IRMA , Université de Strasbourg, France, 2014 to 2016. <ul style="list-style-type: none">• Implement a discontinuous Galerkin solver in OpenCL CPUs, GPUs, and MICs.• Increased software performance by an order of magnitude. Postdoctoral Researcher, M2P2 , Aix-Marseille University, France, 2012 to 2014. <ul style="list-style-type: none">• Designed software for simulating magneto-hydrodynamic turbulence.• Ported code to a grid computing environment with thousands of cores. Sessional Lecturer, University of Alberta , Canada, 2010. <ul style="list-style-type: none">• Lectured differential equations in a team-teaching environment.• Authored an open-source textbook. Graduate Student, University of Alberta , Canada, 2003 to 2011. <ul style="list-style-type: none">• Developed a coherent research program in applied mathematics.• Presented at conferences and publish articles in peer-reviewed journals.
Selected Projects	<code>fftw++</code> (<code>fftwpp.sf.net</code>). <ul style="list-style-type: none">• Implementation of implicitly dealiased convolutions:<ul style="list-style-type: none">– 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. <code>schnaps</code> (<code>schnaps.gforge.inria.fr</code>). <ul style="list-style-type: none">• 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. <ul style="list-style-type: none">• 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 , C# , Python , and FORTRAN , using OpenMP and MPI . Linux scripting, version control, grid computing environments. Data analysis and visualization: L^AT_EX , R , Asymptote , and Paraview .