

Department of Applied Mathematics

University of Waterloo



What is applied mathematics?

- Use of mathematics to solve problems in basic (physics, biology,...) and applied sciences (engineering, medicine, ...)
- Primary tools: mechanistic models (ODEs, PDEs, stochastics,...)
- Active collaborations with researchers outside mathematics
- Development of novel mathematics is often required to solve problems

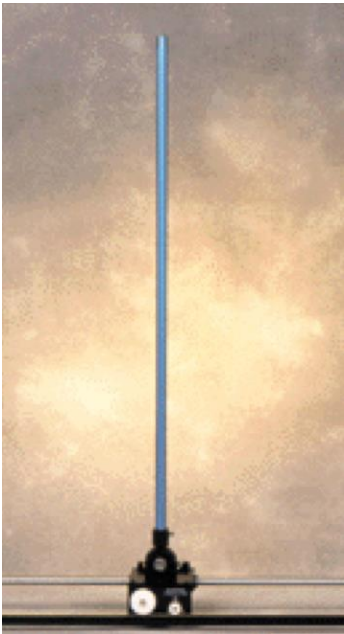
Research Areas

- Control and dynamical systems
- Fluids
- Mathematical Medicine and Biology
- Mathematical Physics
- Scientific computation

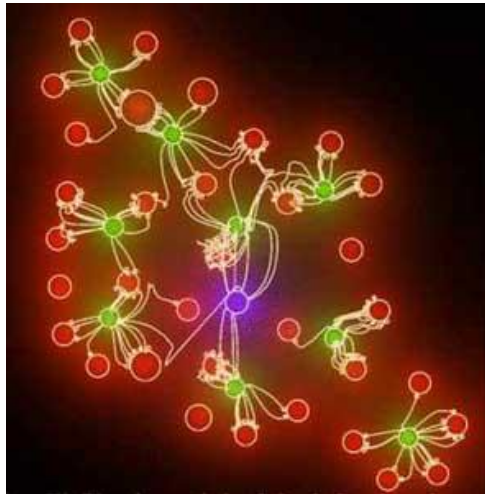
Control and Dynamical Systems

Faculty members: 6

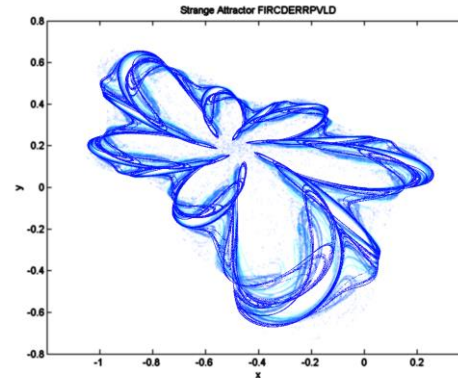
Control systems, Dynamical Systems, Signals & Images,
Differential Equations



Control systems



Neural networks



Stability

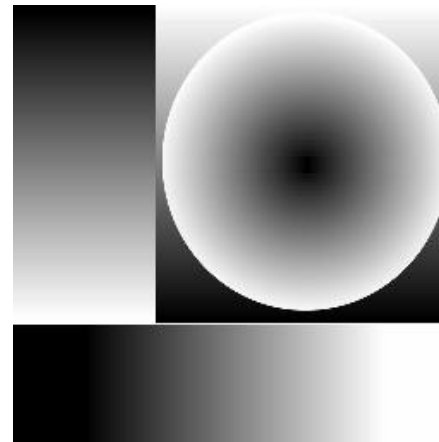
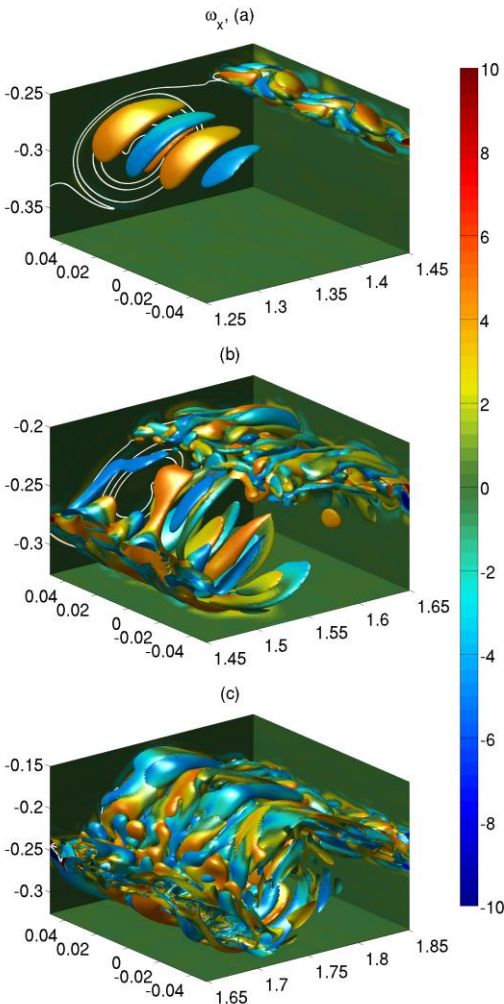


Image
Processing

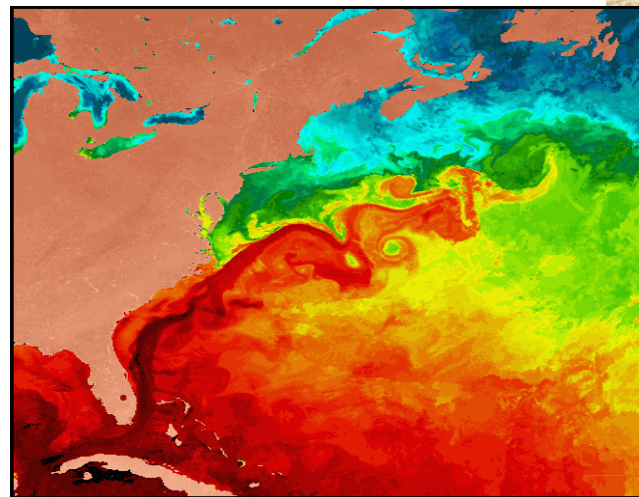
Environmental and Geophysical Fluid Dynamics

Oceanic/Lake circulation



Navier-Stokes equation

Global carbon cycle



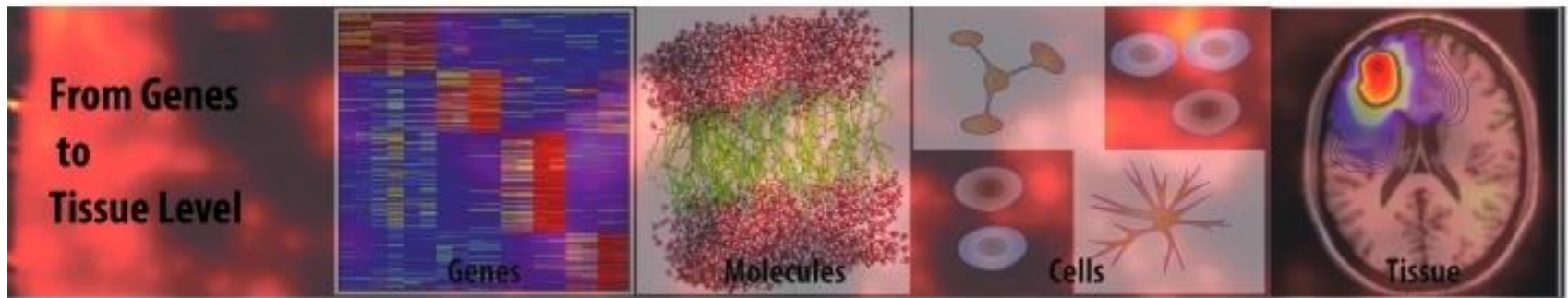
Faculty members: 4



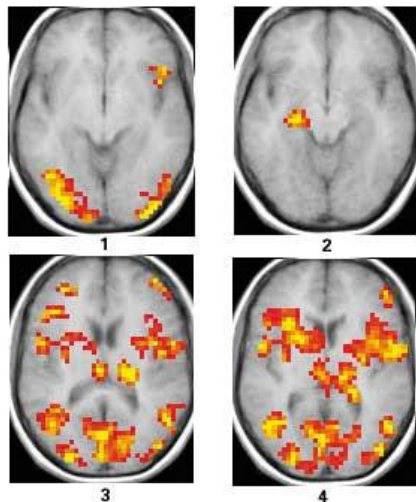
Waves in porous media

Mathematical Medicine & Biology

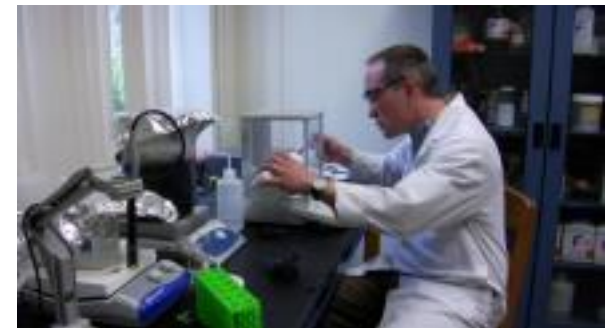
Faculty members: 5



Modelling of tumor growth



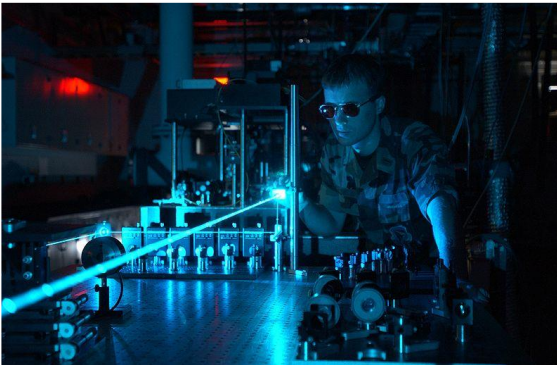
Brain-Biomechanics



Dynamic response to DNA damage

Mathematical Physics

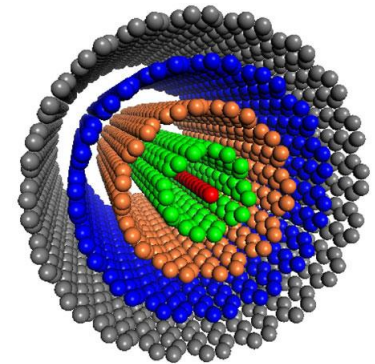
Faculty members: 5



Quantum information/
Quantum computing



Cosmology



Carbon Nanotubes

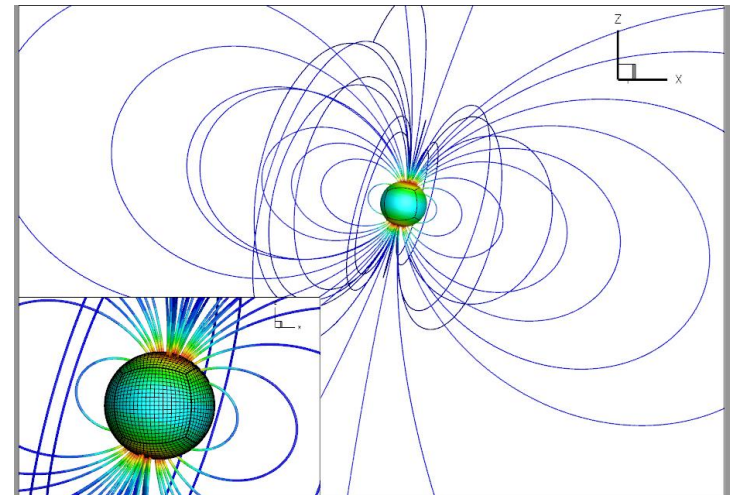
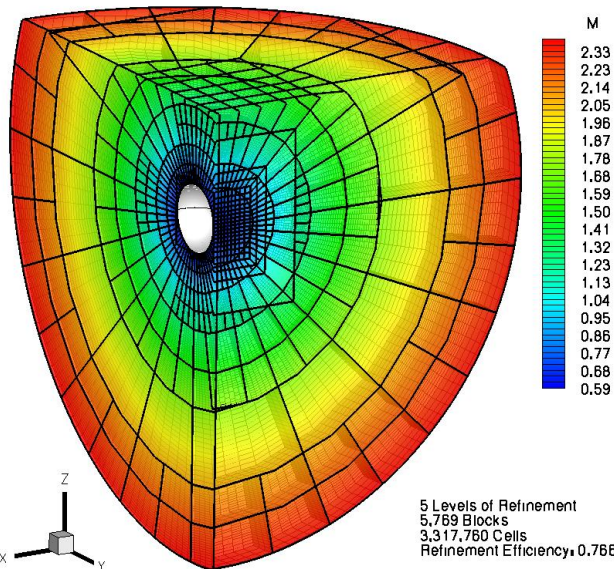
Computational Mathematics/Scientific Computation

Faculty members: 3

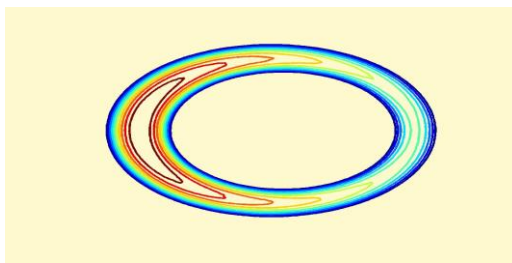
Numerical methods for PDE systems

Numerical linear algebra methods

Parallel computing and GPU computing



Applications in fluid dynamics, musical acoustics, geophysics, Big Data, ...



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Graduate Program in Applied Mathematics at UW

- 87 graduate students (50 PhD, 37 M)
- Largest Applied Math program in Canada
- Intensive collaborations with researchers outside mathematics
- Graduates successful in obtaining academic and industrial positions

Graduate Work in Applied Math

- Graduate students receive full support (tuition and living expenses)
- full-time Master's students receive financial support of at least \$23,000/yr
- Typically 3 TAs/year
- Additional opportunities for income/teaching experience
- Some projects are with external agencies

Master's and PhD programs

- 2-year thesis-based Master's program (with 4 grad courses and a thesis)
- 4-year PhD program (4 additional courses)
- opportunity for direct transfer from Master's to PhD after 1 year
- application deadline: January 15

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Questions ?