Potential Supervisors

Professor **David Kay**

I work on the application and analysis of numerical/computational schemes for partial differential equations. Of major interest is the development of reliable, practical and efficient finite element schemes for modelling mathematical models arising from physical and biological phenomena. Current fields of interest include:

- Multiphysics interaction within the heart and lungs.
- Numerical solvers for cardiac bidomian equations.
- Computational multiscale lung models.
- Stochastic differential equations for ion channel dynamics.
- Numerical models for cell movement.
- Numerical analysis and finite element analysis.

My Google scholar page is **here**.

Software Tools Developed

Lung Chaste - developing software for multiscale lung ventilation simulations.

Involvement of DTC Students

Chris Arthurs now at King's College London. Chris worked on high order methods and software development for cardiac simulations.

Miguel Bernabeu Llinares now at the University of Edinburgh. Miguel worked on the implementation of fast numerical solvers for Bidomian simulations within Chaste environment.

Lorenz Berger now developing surgical planning software in partnership with University College London. Lorenz developed novel computational approaches to whole lung simulations.

Ciara Dangerfield now at the University of Cambridge. Ciara developed methods and studied the effects of stochastic models on the cardiac action potential.