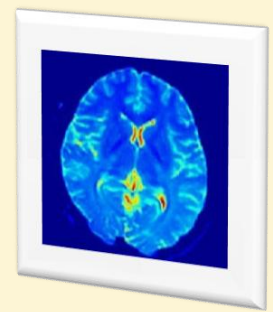




# Short Course on Fractional PDEs

Lecturers: Prof. Fawang Liu and Prof. Zhi-Zhong Sun

May 22-31, 2013



What does it mean to take a fractional derivative of a function, e. g.  $d^{\frac{1}{2}}/dx^{\frac{1}{2}}$  ? What is the interpretation of such fractional derivative? What physical phenomena could be modeled using fractional operators? What numerical approaches are adequate to solve fractional PDEs ? How do we analyze fractional PDEs?

**Schedule of Lectures:** (Location: Room 110, 182 George St; Time: 12:00-1:00pm)

Lecture 1: 22 May, 2013, **Lecturer: Prof. Fawang Liu**

Topic: Numerical methods and analysis of the time, space and time-space fractional PDEs

Lecture 2: 23 May, 2013, **Lecturer: Prof. Zhi-zhong Sun**

Topic: Finite difference methods for the fractional sub-diffusion equation

Lecture 3: 24 May, 2013, **Lecturer: Prof. Fawang Liu**

Topic: Numerical methods for variable order fractional partial differential equations

Lecture 4: 29 May, 2013, **Lecturer: Prof. Zhi-zhong Sun**

Topic: Finite difference methods for the fractional diffusion-wave equation

Lecture 5: 30 May, 2013, **Lecturer: Prof. Fawang Liu**

Topic: Numerical and analytical solutions for the multi-term time-space fractional PDEs

Lecture 6: 31 May, 2013, **Lecturer: Prof. Fawang Liu**

Topic: Analysis of implicit numerical methods for the space-time fractional Bloch-Torrey equations



**Prof. Fawang Liu**

Professor, School of Mathematical Science  
Queensland University of Technology, Australia

**Research Interests:**

Numerical analysis; Fractional Differential Equations; Numerical methods of singular perturbation, adsorbate transport and microwave heating problems and saltwater intrusion into heterogeneous aquifer systems.

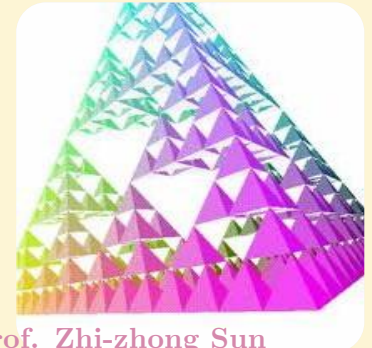


**Prof. Zhi-zhong Sun**

Professor, Department of Mathematics  
Southeast University, P. R. China

**Research Interests:**

Numerical solutions for nonlinear PDEs; Numerical analysis; Error estimates of numerical solutions for fractional PDEs; Numerical solutions for Schrödinger equations, Cahn-Hilliard Equation.



For the latest development of Fractional PDEs, please follow the upcoming symposium:

**International Symposium on Fractional PDEs: Theory, Numerics and Applications, June 3 - 5, 2013.**

<http://www.dam.brown.edu/International%20Symposium/internationalsymposiumonfractionalPDEs.htm>

