

THE MATHEMATICS DEPARTMENT PRESENTS

A MATHEMATICS COLLOQUIUM

THURSDAY, November 19, 2009

BOND HALL 401

4:00 pm

Title: Numerical aspects of some interface problems in fluid mechanics

Speaker: Jianying Zhang, Western Washington University

Abstract: Interface problems occur in a wide variety of research areas, such as physics, chemistry, fluid mechanics, combustion, image processing, computer-aided-design, optimal control and so on. Designing proper numerical techniques for tracking moving interfaces and detecting free boundaries is always important but challenging. In this talk, I will start with a brief introduction to some classical interface problems, along with the corresponding numerical approaches. Then the numerical simulation of two types of interface problems in fluid mechanics will be presented in detail: one is my recent work on an enhanced Euler's method for a free boundary porous medium flow problem, joint with Bin Jiang at PSU; the other one is my current work on the interface detecting in some complex fluid flow, joint with Ian Frigaard at UBC. This talk will be approachable to general audience with reasonable calculus and differential equation background.

Refreshments will precede the talk at 3:30pm in Bond Hall 300, courtesy of Jianying Zhang.