



**The Hong Kong Polytechnic University  
Department of Applied Mathematics**

## **Colloquium**

**On**

**A conservative scheme for solving coupled surface-bulk  
convection-diffusion equations with an application to interfacial  
flows with soluble surfactant**

**by**

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Department of Applied Mathematics  
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### **Abstract**

Many physical problems arising in biological or material sciences involve solving partial differential equations in deformable interfaces or complex domains. For instance, the surfactant which usually favors the presence in the fluid interface may couple with the surfactant soluble in one of bulk domains through adsorption and desorption processes. Thus, it is important to accurately solve coupled surface-bulk convection-diffusion equations especially when the interface is moving. In this talk, we introduce a new conservative scheme for solving this coupled surface-bulk concentration equations which the total surfactant mass is conserved in discrete sense. We then apply the method to simulate the interfacial flow with soluble surfactant under shear flow and drop collisions.

**Date : 8 March, 2013 (Friday)**

**Time : 3:00 p.m. – 4:00 p.m.**

**Venue : HJ610, The Hong Kong Polytechnic University**

**\* \* \* ALL ARE WELCOME \* \* \***