

Liu Bie Ju Centre for Mathematical Sciences  
City University of Hong Kong

## Mathematical Analysis and its Applications Colloquium

Organized by Prof. Ya Yan LU and Prof. Wei Wei SUN

### Noise Attenuation during the Development of Spatial Pattern

by

**Dr. Lei ZHANG**  
City University of Hong Kong, Hong Kong

**Date : Oct 10, 2012 (Wednesday)**

**Time : 4:30 pm to 5:30 pm**

**Venue: Room B6605 (College Conference Room)  
Blue Zone, Level 6, Academic 1 (AC1)  
City University of Hong Kong**

#### **ABSTRACT:**

During development and regeneration of a biological system, different types of cells are organized in a precise spatial pattern to achieve different biological functions. To establish a desirable spatial arrangement of various cells, such as stem cells and terminated differentiated cells, the biological host has to utilize many biological processes including diffusible molecules, feedback regulations on cell lineages, and growth. In this talk, we study how interaction among multiple morphogens and their regulations on cell differentiation capability can robustly control stability of regeneration. We also investigate the underlying mechanisms that attenuate spatial and temporal noises in both extra and intra-cellular spaces to enable formation of distinct regions with sharp boundaries consisting different cell types. In particular, we will investigate two biology systems: regeneration of colonic crypt and development of zebrafish hindbrain, using stochastic PDE models and simulations with moving boundaries.

Light refreshments will be provided at Room B6605 before the colloquium from 4:00 pm to 4:30 pm. Please come and join us!

**\*\* All interested are welcome \*\***

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