

**ISTeC**



**Colorado  
State  
University**

**The Information Science & Technology Center**

*ISTeC.ColoState.edu*

Colorado State University's  
Information Science and Technology Center (ISTeC)  
*presents two lectures by*



**Dr. Qing Nie**

Director, Center for Mathematical and  
Computational Biology  
University of California

## **ISTeC Distinguished Lecture**

in conjunction with the  
Electrical and Computer Engineering Department and  
Computer Science Department Seminar Series

### **“Systems Biology: A Frontier of Computational Science”**

**Monday, November 17, 2008**

Reception: 10:30 a.m.

Lecture: 11:00 – 12:00 noon

Location: CSU Lory Student Center 203



### **Mathematics Department Colloquium**

*sponsored by ISTE C*

### **“Computational Analysis for Morphogens”**

**Monday November 17, 2008**

Lecture: 4:00 – 5:00 p.m.

Location: Weber 202

# ABSTRACTS

## “Systems Biology: A Frontier of Computational Science”

Systems Biology, an explosively growing field, is emerging as a major approach to understand a living world built of interacting sets of complex systems crafted by natural selection to carry out defined tasks. In Systems Biology, the primary tool for translating between form and function is the quantitative modeling and computational exploration. The complexity of the living world provides many more computational challenges than those for physical and engineering systems. There is a vast opportunity to develop new system architectures and computational tools that fully exploit the biological processes and their interactions. In addition to presenting those challenges and opportunity, in this talk I shall also discuss our recent development of new computational tools for spatial dynamics in Systems Biology.

## “Computational Analysis for Morphogens”

Many patterns of cell and tissue organization are specified during development by gradients of morphogens, substances that assign different cell fates at different concentrations. One of the central questions in cell and developmental biology is to identify mechanisms by which the morphogen gradient systems might achieve robustness to ensure reproducible embryonic patterns despite genetic or environmental fluctuations. In this talk, through modeling and computational analysis we will study robustness of morphogen gradients in development of *Drosophila* and zebrafish embryos.

## SPEAKER BIOGRAPHY

Dr. Qing Nie (<http://math.uci.edu/~qnie>) received his B.S. degree in Computational Mathematics from Wuhan University in China (1988), and Ph.D. degree in Mathematics from The Ohio State University (1995). He has been at the University of California at Irvine (UCI) since 1999, and holds a joint appointment of Biomedical Engineering and Mathematics. Currently, he is a Chancellor's Fellow of UCI, the director for UCI Center for Mathematical and Computational Biology, an associate director for the UCI Ph.D. training program in Mathematical and Computational Biology supported by Howard Hughes Medical Institute, and a core leader for a NIH national center of excellence in systems biology at UCI. Dr. Nie also serves in the editor board of *Mathematical Biosciences and Engineering*.

**To arrange a meeting with the speaker**, please contact James Liu at (970) 491-3067 or [liu@math.colostate.edu](mailto:liu@math.colostate.edu).

**ISTeC (Information Science and Technology Center)** is a university-wide organization for promoting, facilitating, and enhancing CSU's research, education, and outreach activities pertaining to the design and innovative application of computer, communication, and information systems. For more information please see [ISTeC.ColoState.edu](http://ISTeC.ColoState.edu).