

Mini-Workshop on “Computational Engineering for Biotechnology and  
Nanotechnology”  
July 27-28, 2006

**Location: CIT Auditorium, Computer Centre Level 2  
National University of Singapore (NUS), Singapore**

**Tentative Agenda (List of Speakers)**

**Day 1: Thursday, July 27<sup>th</sup>**

9:00~9:10am

Jacob White (MIT) or Boo Cheong Khoo (NUS)

“Overview of CE SMA-II program”

***Session 1: Engineering and Modeling at the Nanoscale: Nanofluidics***

9:10~9:35am (20 min talk / 5 min Q&A)

Jongyoon Han (MIT)

“New Engineering Opportunities and Challenges in Nanofluidics”

9:35~10:00am (20 min talk / 5 min Q&A)

Lian Hing Tan (SMA-II) and Laura Proctor (MIT)

“Modeling of concentration polarization in nanofluidic devices” (tentative)

10:00~10:25am (20 min talk / 5 min Q&A)

Dmitry Vasilyev and Jacob White (MIT)

“Extracting Reduced Order Models of Microfluidic Channels” (presented by J. White)

**10:25~10:45am**

**Coffee Break**

10:45~11:10am (20 min talk / 5 min Q&A)

Jianping Fu (MIT)

“Anisotropic Nanofluidic filter array for continuous-flow biomolecule separation”

11:10~11:35am (20 min talk / 5 min Q&A)

Duong-Hong Duc (NUS)

“Modeling of molecular filtration in nanofluidic sieving systems”

11:35am~12:00pm (20 min talk / 5 min Q&A)

Zirui Li (NUS)

“Modified SPH method for simulating molecular filtration in nanofluidic sieving systems”

12:00~12:25pm (20 min talk / 5 min Q&A)

Nam-Trung Nguyen (NTU)

“SU-8 as material for polymeric microdevices”

**12:25~1:30pm**  
**Lunch Break**

***Session 2: Engineering and Modeling at the Microscale: Massively parallel Cell traps and Filters***

1:30~1:55pm (20 min talk / 5 min Q&A)

Joel Voldman (MIT)

“New Opportunities in Cellular BioMEMS” (tentative)

1:55~2:20pm (20 min talk / 5 min Q&A)

Le Duc Vinh (NUS)

“An Immersed Interface Method for Viscous Flow and Deformable Boundary Interaction”

2:20~2:45pm (20 min talk / 5 min Q&A)

Li Changming (NTU)

“Microfluidic bionanosystems”

2:45~3:10pm (20 min talk / 5 min Q&A)

Cui Haihang, Research Fellow (NUS)

“Design and Experimentation of particle trap”

**3:10~3:30pm**  
**Coffee Break**

3:30~3:55pm (20 min talk / 5 min Q&A)

Wang Zhengfeng (SIMTech)

“Platform Integration for Hybrid Microelectrofluidic Systems”

3:55~4:20pm (20 min talk / 5 min Q&A)

Lim Kian-Meng (NUS)

“Accelerated boundary element method for Laplace and Poisson problems”

4:20~4:45pm (20 min talk / 5 min Q&A)

Brian Taff (MIT)

“Cell Trap Array” (tentative)

4:45~5:10pm (20 min talk / 5 min Q&A)

Wang Shengyin (NUS)

“Large deformation analysis of red blood cells in a microfluidic channel”

5:10~5:30pm

Coffee/Snack-hour social / Wrap-up discussion / Interaction

6:00pm~???

(Optional: Social hours with SMA students (current/new) over dinner)

## **Day 2: Friday, July 28<sup>th</sup>**

### ***Session 3: New challenges and opportunities in modeling and simulations***

9:00~9:25am (20 min talk / 5 min Q&A)

Karen Wilcox (MIT)

“Model-Constrained Optimization for Reduction of Large-Scale Systems”

9:25~9:50am (20 min talk / 5 min Q&A)

Bo S. Kim (MIT)

“Biological Networks” (tentative)

9:50~10:15am (20 min talk / 5 min Q&A)

Jaydeep Bardhan (MIT)

“to be determined”

### **10:15~10:35am**

#### **Coffee Break**

10:35~11:00am (20 min talk / 5 min Q&A)

Evert Klaseboer (IHPC)

“Bubble dynamics” (tentative)

11:00am~11:25am (20 min talk / 5 min Q&A)

Shihhsien Kuo and Jacob White (MIT)

“Higher Order Methods for Analyzing Biomolecules in Ionic Solutions” (presented by J. White)

11:25am~11:50pm (20 min talk / 5 min Q&A)

Carlos Coelho and Jacob White (MIT)

“to be determined”

11:50~12:00pm

Wrap up