Workshop II: Microfluidic Flows in Nature and Microfluidic Technologies

Tuesday April 18, 2006

8:00–8:45 *Check-In/Light Breakfast (Hosted by IPAM)*

8:45–9:00 *Welcome and Opening Remarks*

9:00–10:00 **Howard Winet** (UCLA)
Muscle pump-enhanced microfluidic percolation of bone as an adjunct to fluid shear stress modulation of bone cells in vivo

10:00–10:30 *Break*

10:30–11:30 **Chih-Ming Ho** (UCLA)
The Challenges of Applying Microfluidics Towards Biomedical Applications

11:30–2:00 *Lunch (on your own)*

2:00–3:00 **Sandip Ghosal** (Northwestern University)
The mathematics of bio-separations: electroosmotic flow and band broadening in capillary electrophoresis (CE)

3:00–3:30 *Break*

3:30–4:30 **Anna lin** (Duke University)
Probing chemical communication between neuron-glial cell networks with microfluidic devices

4:30–5:30 **Amy Shen** (Washington University in St. Louis)
Forisome: a smart plant protein inside a phloem system

5:30–7:00 *Reception/Poster Session (Hosted by IPAM)*

Wednesday April 19, 2006

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Armand Ajdari** (École Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI))
Motion of droplet in microfluidic networks:complexity and passive solutions

10:00–10:30 *Break*

10:30–11:30 **Ali Nadim** (Claremont Graduate University)
Discrete Control of Liquid Drops on a Surface using Electrowetting

11:30–2:00 *Lunch (on your own)*

2:00–3:00 **Abraham Lee** (University of California, Irvine)
Control of Droplet Emulsions in Microfluidic Devices

3:00–3:30 *Break*

(Wednesday schedule continued on next page)

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3:30–4:30 **Michael Brenner** (Harvard University)
Constraints On Ion Channel Evolution

4:30–5:30 **Juan Santiago** (Stanford University)
Electrokinetic Microfluidics at Extreme Scales

Thursday April 20, 2006

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Todd Squires** (UC Santa Barbara)
Engineering on the pore scale for microfluidic systems

10:00–10:30 *Break*

10:30–11:30 **Stephen Quake** (Stanford University)

11:30–2:00 *Lunch (on your own)*

2:00–3:00 **John Kessler** (University of Arizona)
Flows, forces and transport associated with swimming microorganisms

3:00–3:30 *Break*

3:30–4:30 **Richard McLaughlin** (University of North Carolina)
Spinning Rods and Passive Tracers, from Nano and Micro Scale, to table top scale

4:30–5:30 **Ming-Cheng Cheng** (Ohio State University Newark)

Friday April 21, 2006

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Isaac Klapper** (Montana State University - Bozeman)
Biofilms as Fluids

10:00–10:30 *Break*

(Friday schedule continued on next page)

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10:30–11:30 **Anette Hosoi** (MIT)
Building a Better Snail: Lubrication and Adhesive Locomotion

11:30–2:00 *Lunch (on your own)*

2:00–3:00 **Linda Cummings** (University of Nottingham)
Fluid flow problems in rotating bioreactors

3:00–3:30 *Break*

3:30–4:30 **John Lowengrub** (University of California, Irvine)
Adaptive simulations of drop/interface impact

4:30–5:30 **Wendy Zhang** (University of Chicago)
Broad Hump or Sharp Cusp: Topological Transition Driven by Viscous Flow

Saturday April 22, 2006

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Andrea Chow** (Association for Laboratory Automation)
Challenges in Microfluidic Technology Development and Commercialization

10:00–10:30 *Break*

10:30–11:30
TBA

11:30–2:00 *Lunch (on your own)*

2:00–3:00 **Darren Link** (RainDance Technologies, Inc.)
NanoReactorTM Technology: Active Manipulation of Droplet-Based Bioreactors

3:00–3:30 *Break*

3:30–4:30 **John Frangos** (La Jolla Bioengineering)
Microfluidic interstitial fluid flow and bone remodeling.