

## Special Program in Applied Mathematics and Applied Mechanics

*Electrokinetic Ion and Nanoparticle Transport in Nanofluidics*

2014 - 11 - 12 (Wed.)

15:00 - 18:00

308, Mathematics Research Center Building (ori. New Math. Bldg.)

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Electrokinetics has emerged as one of the promising techniques to manipulate ions, fluid, and (bio)nanoparticles in nanofluidic devices, which have attracted considerable attention in using them as next-generation platforms for sensing single biomolecules and regulating ion transport. In this talk, what is the major difference between microfluidics and nanofluidics will be first introduced, followed by a brief introduction of the fascinating features often observed in nanofluidics such as ion selectivity, ion concentration polarization (ICP), ionic current rectification (ICR), and streaming current. The detailed content includes (1) the numerical modelling of the electrokinetic ion and nanoparticle transport in nanofluidics, (2) the analytical expressions for the surface charge property, electroosmotic flow, ionic current/conductance, and streaming current/conductance in the gated/un-gated nanofluidics, and (3) the experimental results of the electrokinetic flow-driven rectification of the ion current in a tunable polymer nanopore.

