

**RYERSON UNIVERSITY  
DEPARTMENT OF MATHEMATICS  
BIOMATHEMATICS & FLUIDS SEMINAR**

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Department of Mechanical and Industrial Engineering

Date: Thursday, February 6, 2014

Time: 11:10am

Location: ENG 210

## **Particle coating in low Reynolds number flows**

### **Abstract:**

Coating flows are an important class of problems in fluid mechanics. Typically a substrate is coated by a moving continuous film, but it is also possible to consider coating of discrete objects. In applications involving coating of particles that are useful in drug delivery, the coating layer acts as a drug-carrying vehicle, while in cell therapy a thin polymeric coating is required to protect the cells from the host's immune system. Although many functional capabilities have been developed for lab-on-a-chip devices, a technique for coating has not been demonstrated. Here we present a microfluidic platform, based on low Reynolds number flows, developed to coat micron-size spheres with a thin aqueous layer by magnetically pulling the particles from the aqueous phase to the non-aqueous phase in a co-laminar stream. The coating thickness can be adjusted by the average flow speed and the number of beads encapsulated inside a single cluster can be tuned by the ratio of magnetic to interfacial forces acting on the beads.

ALL FACULTY, STAFF, STUDENTS AND GUESTS ARE WELCOME TO ATTEND