



THE CHINESE UNIVERSITY OF HONG KONG  
*Department of Physics*  
COLLOQUIUM

# Motion in Bacterial Swarms: from the Cells to the Milieu

*by*

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*Date: January 13, 2012 (Friday)*

*Time: 4:00 - 5:00 p.m.*

*Place: L2 Science Centre, CUHK*

*(Light refreshments will be served 20 minutes prior to the colloquium.)*

ALL INTERESTED ARE WELCOME

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## Abstract

Microbial life exists mostly as surface-associated communities called biofilms. When establishing biofilms, many bacterial species are able to move across surfaces in multicellular groups, a process known as swarming. Bacterial swarms provide a unique system for the study of self-propelled particles and complex fluids. In this talk I will discuss recent progress in understanding the mechanics of swarming, focusing on the motion of swarm cells and of their microfluidic environment. Swarm cells tend to reverse moving directions regularly. Modeling results suggest that this unusual maneuver allows cells to self-organize efficiently and to move smoothly, without jamming in crowded conditions. Swarms powered by flagellar motility are covered by a thin layer of fluid ~1 micron in thickness. This fluid film exhibits several surprising flow patterns, including a “river” running clockwise around the swarm edge at speeds of order 10 micron/s, which provides an avenue for long-range communication in bacterial colonies.

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