

# PHYSICAL MATHEMATICS SEMINAR

## MOTION AT LOW REYNOLDS NUMBER

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### **ABSTRACT:**

Two rather different cases of motion at low Reynolds number are presented here. One is related to biolocomotion, the other to free surface flows.

We will first examine the swimming properties of micro-organisms. Most living organisms exist at micrometric scales and many of them are able to propel themselves by beating flagella in a variety of different patterns. This study focuses on optimal flagellar swimming motions at low Reynolds number. We seek to optimize both the geometry of the swimmer and the kinematics of the flagellar beat pattern. This study first focuses on the optimal swimming of Purcell's simple three link swimmer. A number of more complex configurations will also be investigated including unflagellate and biflagellate organisms.

Next, we will look at the convective flow inside a small droplet of water sitting on top of a heated super-hydrophobic surface. Water is observed to be driven upwards on the surface of the spherical droplet and to accelerate downwards inside the droplet towards the contact point with the substrate. The driving mechanism of these convective rolls is investigated experimentally and numerically.

**TUESDAY, FEBRUARY 26, 2008**

**2:30 PM**

**Building 4, Room 370**

*Refreshments at 3:30 PM in Building 2, Room 349  
(Applied Math Common Room)*



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