

Date: **February 23rd**

Time: **11:00 AM**

Location: **Maryland Hall 110**

Speaker: **Dr. Kenneth Breuer**
 Brown University

Title: **"Bacterial Microfluidics"**

Abstract

Flagellated bacteria, such as E. Coli, propel themselves using multiple flagella - long, thin helical filaments - that are rotated using nanoscale motors. We will discuss several aspects of the fluid mechanics associated with bacterial motility, studied using scale modeling, numerical simulations and microscale experiments. The phenomena explored include the mechanics of flagellar bundling, in which several distinct filaments combine into a single helical bundle via viscous hydrodynamic interactions, the flow fields associated with viscous helical motions, and mechanisms for hydrodynamic synchronization of adjacent flagella motion. We will also show how the flagella motion can be harnessed in engineered systems to enhance low Reynolds number mixing, to pump fluids, and to transport objects through microfluidic systems.