Temple University Mathematics Colloquium

Lisa Fauci
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will speak on

Spirochetes and spermatozoa: Fluid dynamic models of microorganism motility

ABSTRACT: The observed swimming behavior of a motile microorganism is the result of a complex interplay between mechanisms of internal force generation, the passive elastic properties of its structure, and a surrounding viscous fluid. In this talk, we will focus on two very different types of microorganisms: the spirochetes, which are a type of bacteria characterized by an efficient mode of motility that allows them to screw through viscous fluids and mucosal surfaces, and spermatozoa, that undulate as a result of the action of thousands of molecular motors positioned along the flagellum. We will present mathematical and computational models that couple the internal force generating mechanisms of these microorganisms with external fluid mechanics. We will describe our methodology, which includes both the method of regularized Stokeslets and the immersed boundary method. We will discuss recent successes as well as challenges associated with these models.

Monday, February 6, 2006
Lecture at 4:00 PM (♯)
Coffee, tea, and refreshments from 3-5 PM.
Room 617, Wachman Building
Department of Mathematics