

***DISTINGUISHED
LECTURER SERIES***

***VCU
MECHANICAL ENGINEERING***

***Optimizing
Locomotion***



***Professor Anette Hosoi
MIT***

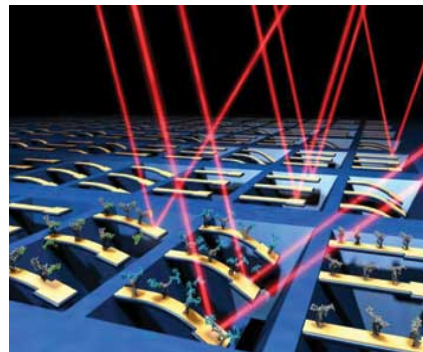
22 October 2007

***Social Hour: 11:30-12:00 noon
Seminar: 12:00-1:00 pm***

***Room 106
Engineering Building***

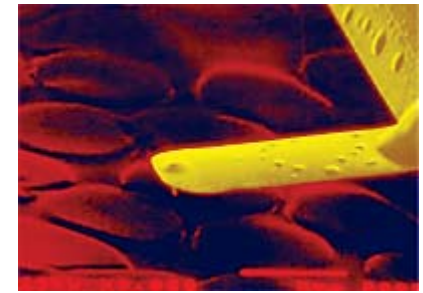
ABSTRACT

In this talk I will discuss two optimization topics related to low Reynolds number locomotion: optimal stroke patterns in linked swimmers and optimal fluid material properties in adhesive locomotion. In contrast to many optimization problems, we do not consider geometry, rather we optimize the swimming kinematics or fluid material properties for a given geometrical configuration. In the first case, we begin by optimizing stroke patterns for Purcell's 3-link swimmer. We model the swimmer as a jointed chain of three slender links moving in an inertialess flow. The swimmer is optimized for both efficiency and speed. In the second case, we analyze the adhesive locomotion used by common gastropods such as snails and slugs. Such organisms crawl on a solid substrate by propagating muscular waves of shear stress on a viscoelastic mucus. Using a simple mechanical model, we derive criteria for favorable fluid material properties to lower the energetic cost of locomotion



BIO

Anette (Peko) Hosoi is a professor of Mechanical Engineering at MIT. Her research interests include fluid mechanics, biomimetics and locomotion, with a recent focus on optimization of crawling snails and swimming microorganisms. Prof. Hosoi received her Ph.D. in Physics from the University of Chicago and went on to become an NSF Postdoctoral Fellow (at MIT and the Courant Institute). She is the recipient of the 3M Innovation Award and has held the Doherty Chair in Ocean Utilization. In addition, she has won numerous teaching awards including the Ruth and Joel Spira Award for Distinguished Teaching and the Junior Bose Award for Excellence in Teaching.



Contact:

***Mechanical Engineering
School of Engineering
Virginia Commonwealth
University***

***601 West Main St
Richmond, VA 23284-3015***

Office: 804-828-9117

Fax: 804-827-7030

