

PHYSICAL MATHEMATICS SEMINAR

IMPULSIVE FLUID FORCING AND THE GAIT OF THE WATER STRIDER

OLIVER BUHLER
Courant Institute, New York University

ABSTRACT:

This talk presents a theoretical study that has been motivated by recent laboratory experiments on the locomotion of water-walking insects. These insects create both waves and vortices by their rapid leg strokes and it has been a matter of some debate whether either form of motion predominates in the momentum budget. Here it is argued that generically both waves and vortices are significant, and that they take up the momentum with share $1/3$ and $2/3$, respectively. This result is based on classical impulse theory adapted to flows with a free surface. Owing to its generality, the present theory could be useful for other fluid--structure interaction problems in animal locomotion and elsewhere.

TUESDAY, OCTOBER 25, 2005

2:30 PM

Building 3, Room 370

Refreshments at 3:30 PM outside of Room 370



Massachusetts Institute of Technology
Department of Mathematics
Cambridge, MA 02139