Special
PHYSICAL MATHEMATICS SEMINAR

THE PHYSICS OF FLOATING AND SINKING

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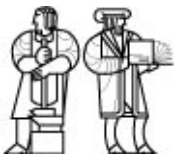
ABSTRACT:

A popular demonstration of the effects of surface tension is to float a small metal object, such as a thumbtack, on the surface of water. Such objects appear to violate Archimedes' principle: they float despite being many times more dense than water. It is the surface tension of water that provides the force required to balance the object's excess weight, as can be demonstrated from a generalization of Archimedes' principle. In this seminar, we will study the conditions under which floating is possible and show how an object light enough to be supported in equilibrium by surface tension can sink if it strikes the interface too quickly. The results of these investigations allow us to understand some of the adaptations of water-walking insects to life at an air–water interface. We also consider the interactions between floating particles, which are observed everywhere from bowls of cereal to bubbles floating in a pint of beer. These interactions give rise to a range of novel behavior from the sinking of individual objects to the appearance of an unusual interfacial rheology as the particles become densely packed.

THURSDAY, JANUARY 25, 2007
2:30 PM
Building 2, Room 105

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



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