

The Oliver Club

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Group Dynamics in Phototaxis

Microbes live in environments that are often limiting for growth. They have evolved sophisticated mechanisms to sense changes in environmental parameters such as light and nutrients. Optimizing the environmental conditions is conducted by moving in a particular direction, a motion known as "chemotaxis" or "phototaxis." The various patterns of motion appear to be a complex function of cell density, surface properties and genotype. In this talk we will present a hierarchy of new models for phototaxis that were constructed based on experimental observations: a stochastic model, a particle system, and a system of partial differential equations. Our main theorem proves that the resulting system of PDEs is indeed the limit of the particle system. This is a joint work with Devaki Bhaya (Department of Plant Biology, Carnegie Institute) and Tiago Requeijo (Math, Stanford).

Doron Levy

University of Maryland

Refreshments will be served at 3:55 PM in the Mathematics Department lounge (532 Malott Hall).



Thursday, March 6, 2008
at 4:25 PM in 406 Malott Hall