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Seeing Spots: Liquid domains in Lipid Membranes

Tuesday April 22, 2008 1:00pm
Otto Maass room 10

We study a very simplified version of cell membranes, called giant lipid vesicles. Much of our past work has focused on finding the minimum number of lipid types required to create liquid domains on the surface of a vesicle, to mimic a behavior thought to occur in cells. We find that liquid domains appear on the surface of vesicles containing the following minimum components: a high melting temperature lipid, a low melting temperature lipid, and cholesterol. These three components separate into two phases. This presents an interesting question of which components are in which phases, and in what amounts. I will review our work using fluorescence microscopy and NMR to determine the lipid composition inside the liquid domains vs. in the membrane outside the domains, and to map phase diagrams and to quantify tie-lines. Our work in the past year has focused on two new projects. We study how domains diffuse across the two-dimensional vesicle surface. We also study how domains on one side of the membrane (in one of the two bi-layer leafs) are induced in an opposite, initially uniform side of the same membrane.

This seminar is intended to be at a level that is appropriate both for experts, as well as for non-experts outside of the field of study.

Everyone is welcome
