

PHYSICAL MATHEMATICS SEMINAR

Liquid Infused Surfaces and Phase Separation on Bicontinuous Cubic Membranes

HALIM KUSUMAATMAJA
Department of Physics
Durham University

ABSTRACT:

This seminar consists of two parts. First, I will talk about a novel class of functional surfaces, termed liquid infused surfaces, which have been shown to exhibit a wide-range of advantageous surface properties, including self-cleaning, drag reduction, anti-icing and anti-fouling. Unlike standard wetting problems, our theory shows that the contact angle of a droplet on liquid infused surfaces is not uniquely defined by material parameters, but also has a strong dependence on the size of the droplet and the pressure of the infusing liquid. Further, I will also argue why liquid droplets can move easily across these surfaces.

In the second part of the talk, I will describe our recent simulations on phase separation on bicontinuous cubic membranes, whereby lipids form a triply periodic bilayer that separates two percolating and non-intersecting water channels. In particular, we find an interesting competition between a curvature favoured splitting and a line tension favoured coalescing mechanism for the membrane phase separation. With increasing the line tension contribution, we also observe a facetting of the domains that we explain with a simple argument based on the symmetry of the underlying geometry.

TUESDAY, MAY 9, 2017

2:30 PM

Building 2, Room 147

*Reception following in Building 2, Room 290
(Math Dept. Common Room)*

<http://math.mit.edu/seminars/pms/>