

Small volume fraction limit of a nonlocal isoperimetric problem

Ihsan Topaloglu*

ihsan.topaloglu@math.mcmaster.ca

The nonlocal isoperimetric problem that I will consider in this talk arises as the sharp interface limit of Ohta-Kawasaki functionals introduced to model microphase separation of diblock copolymers. In our problem there is an additional term which penalizes one phase hence forces the other block copolymer phase into a confinement region. Using Γ -convergence we will identify the first- and second-order effective energies in the asymptotic limit of small volume fraction and strong confinement. Depending on the choice of penalization we will show that the second-order limit of these energies will be given by attractive-repulsive nonlocal interaction energies of weighted Dirac-delta functions corresponding to the concentration of mass into point particles.

This is joint work with S. Alama, L. Bronsard and R. Choksi.

*Department of Mathematics and Statistics, McMaster University, 1280 Main Street West, Hamilton, ON L8S 4K1, CANADA.