IHSAN A. TOPALOGLU, Virginia Commonwealth University

Droplet phase in a nonlocal isoperimetric problem under confinement

In this talk I will consider the small volume-fraction asymptotic limit of a nonlocal isoperimetric functional with a confinement term. This functional is derived as the sharp interface limit of a variational model for self-assembly of diblock copolymers under confinement by nanoparticle inclusion. By considering confinement densities which are spatially variable and attain a nondegenerate maximum, I will present a two-stage asymptotic analysis in the sense of Γ-convergence wherein a separation of length scales is captured due to the competition between the nonlocal repulsive and confining attractive effects in the energy. The results will also relate to existence and non-existence of minimizers of a recently well-studied nonlocal isoperimetric functional which appears in the liquid drop model. This is a joint work with S. Alama, L. Bronsard, R. Choksi.