1032-35-160 **Rustum Choksi*** (choksi@math.sfu.ca), Department of Mathematics, Simon Fraser University, Burnaby, BC V5A 1S6, Canada. *On the Phase Diagram for Microphase Separation of Diblock Copolymers: Small Volume Fraction Regimes.*

Diblock copolymer melts present a physical paradigm for periodic phase separation. On the other hand, a simple model gives rise to a nonlocal functional which itself is a mathematical paradigm for energy-driven pattern formation associated with short and long-range interactions. In this talk I will discuss the phase diagram associated with this nonlocal functional, focusing on rigorous results. In particular, I will consider the small volume fraction regime via a a two-stage/scale Gamma-limit: the highest order to a local energy on dirac masses and the next order to a Coulomb-like interaction energy. This is joint work with Mark Peletier (Eindhoven University of Technology) and J.F. Williams (SFU). (Received August 20, 2007)