Minimizers of a variational problem for nematic liquid crystals with variable degree of orientation in two dimensions

5th, November

Abstract: We study the asymptotic behavior, when $k \to \infty$, of the minimizers of the energy $G_k(u) = \int_{\Omega} \big((k-1)|\nabla u|^2 + |\nabla u|^2\big)$, over the class of maps $u \in H^1(\Omega, \mathbb{R}^2)$ satisfying the boundary condition $u = g$ on $\partial \Omega$, where $\Omega$ is a smooth, bounded and simply connected domain in $\mathbb{R}^2$ and $g : \partial \Omega \to S^1$. The motivation comes from a simplified version of Ericksen model for nematic liquid crystals. We will present similarities and differences with respect to the analog problem for the Ginzburg-Landau energy.

Based on a joint work with Dmitry Golovaty.