LORENZO SARNATARO, University of Toronto
The Allen—Cahn equation and free boundary minimal surfaces

In recent years, the combined work of Guaraco, Hutchinson, Tonegawa, and Wickramasekera has established a min-max construction of minimal hypersurfaces in closed Riemannian manifolds, based on the analysis of singular limits of sequences of solutions of the Allen—Cahn equation, a semi-linear elliptic equation arising in the theory of phase transitions. In this talk, I will describe some recent boundary regularity results for such limit-interfaces, which provide the first step towards an Allen—Cahn min-max construction of free boundary minimal hypersurfaces in Riemannian manifolds with boundary. This is based on joint works with Akashdeep Dey, Wenkui Du, Martin Li, and Davide Parise.