The fractional Allen-Cahn equation and nonlocal minimal surfaces

Vincent Millot*[1]

[1]Laboratoire Jacques-Louis Lions (LJLL) – INRIA, Université Paris VII - Paris Diderot, CNRS : UMR7598 – B.C. 187 75252 Paris Cedex 05, France

Abstract

In this talk, I will present a convergence result for a fractional version of the Allen-Cahn equation where the Laplacian is replaced by the fractional Laplacian with exponent s between 0 and 1/2. In a singular limit, (arbitrary) solutions of this equation tend to stationary nonlocal minimal surfaces, i.e., critical point of the fractional 2s-perimeter introduced recently by Caffarelli-Roquejoffre-Savin. This generalizes to the fractional setting a result due to Hutchinson and Tonegawa. My talk is based on a joint work with Yannick Sire and Kelei Wang.

*Speaker