

The Euclidean Isoperimetric problem and its gradient flow: a phase transitions approach

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In the first part of this talk, we will introduce an approximation to the Euclidean isoperimetric problem using the Allen-Cahn energy with a novel volume constraint. This approximating model shares several rigidity properties with the isoperimetric model: uniqueness and rigidity of minimizers; and rigidity of critical points (in the sense of Alexandrov's theorem). In the second part of the talk, we will consider the gradient flow associated to this model, regarding it as an approximation to the Volume Preserving Mean Curvature Flow, and we will show that this flow converges (under very general assumptions) to a single (diffused) ball. This talk is based on joint work with Francesco Maggi and Matteo Bonforte.

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