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Alessio Figalli* (figalli@math.polytechnique.fr). *Quantitative isoperimetric inequalities and stability of crystals.*

The equilibrium shape of a crystal is determined by the minimization under a volume constraint of its free energy, consisting of an anisotropic interfacial surface energy plus a bulk potential energy. In the absence of the potential term, the equilibrium shape can be directly characterized in terms of the surface tension and turns out to be a convex set, the Wulff shape of the crystal. Our first result is a sharp quantitative inequality showing that any shape with almost-optimal surface energy is close in L^1 to the Wulff shape. This is a joint work with Francesco Maggi (Florence) and Aldo Pratelli (Pavia). Under the action of a weak potential, or equivalently if the total mass of the crystal is small enough, the surface energy of the equilibrium shape is actually close to that of the corresponding Wulff shape, and the previous result applies. However, stronger geometric properties are now expected (like convexity or closedness in some stronger norm), due to the fact that the considered shapes are minimizers. This is a joint work with Francesco Maggi (Florence). (Received September 07, 2009)