



Junior Analysis Seminars 2026

October 15th, 2026 – 3 pm

Department of Mathematics and Applications “Renato Caccioppoli”
University of Naples “Federico II”
Room: Sala Riunioni, first floor

Generalized minimizers for the capillarity energy outside convex obstacles

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Abstract. For capillarity energies outside an unbounded obstacle, volume-constrained minimizers may fail to exist, as minimizing sequences can escape to infinity.

In this talk, We study this minimization problem outside a closed convex obstacle C . Via a Γ -convergence result for capillarity energies outside equibounded sequences of closed convex obstacles converging in the Hausdorff sense, we prove that the infimum of the functional is attained by a generalized minimizer, namely, a finite union of regions, each of which minimizes the capillarity energy outside a limit of translations of C in its volume class, with the total volume satisfying the prescribed constraint. Moreover, every generalized minimizer can be suitably approximated by an infimizing sequence, thus providing a description of its asymptotic behaviour.

As an application, we study the isoperimetric profile associated with the capillarity energy and the influence of the asymptotic geometry of the obstacle on generalized minimizers. In particular, we identify a condition on the asymptotic geometry of C under which generalized minimizers are always connected and are given by spherical caps. When this condition is not satisfied, we prove that generalized minimizers are connected for sufficiently small and sufficiently large volumes. For arbitrary volumes, we establish a bound on the number of connected components which is independent of both the convex obstacle and the prescribed volume.

This talk is based on joint work with Simone Vincini (University of Vienna).

Organizers. Francesca de Giovanni, Giuliana Fusco, Miriam Piccirillo

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