UNIVERSITÀ DI PARMA

Dipartimento di Scienze Matematiche, Fisiche e Informatiche

Seminario di Analisi Matematica

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A capillarity theory approach to the analysis of soap films

Lunedì 15 maggio 2023, ore **14:30**
Aula A, Piano -1, Plesso di Matematica e Informatica

Abstract: *Soap films in equilibrium hanging from a boundary wire are classically modeled as two-dimensional surfaces with everywhere vanishing mean curvature (minimal surfaces). By neglecting their intrinsic three-dimensional structure, this model fails at capturing some of the physical properties of soap films observed in the experiments, particularly when dealing with boundary wires of large diameter.*

In this talk, I will present a variational model, based on Gauss' theory of capillarity, which aims at overcoming this issue by regarding soap films as sets of minimal perimeter enclosing a prescribed volume of fluid and satisfying a spanning condition of homotopic type. I will discuss the corresponding existence theory and the asymptotic behavior of minimizers in the vanishing volume limit. Then, I will focus on the regularity theory, which provides further information on the local geometry of solutions.

Based on joint works with Darren King (NYU), Francesco Maggi (UT Austin), and Antonello Scardicchio (ICTP Trieste).

Organizzatori proff. Alessandra Lunardi e Giampiero Palatucci