DIPARTIMENTO DI MATEMATICA

Colloquio di Dipartimento

31 Maggio 2019 ore 16:00

aula Vitali

Xavier Cabré

ICREA and Universitat Politècnica de Catalunya (Barcelona)

Nonlocal minimal surfaces

In 2010 Caffarelli, Roquejoffre & Savin started the study of nonlocal minimal surfaces, that is, of hypersurfaces in Euclidean space with zero nonlocal mean curvature.

This is the equation associated to critical points of the fractional perimeter.

Among other motivations (such as image processing), they are relevant in phase-transition phenomena in the presence of long range interactions.

Since their introduction, nonlocal minimal surfaces have attracted much attention, first and foremost to understand their regularity and to make progress towards their classification.

We will describe the results obtained up to date, as well as the remaining open problems.

As we will see, there is a remarkable resemblance with the classical theory of minimal surfaces.

$$\mathrm{Per}_s(E;\Omega) := \int_\Omega \int_\Omega \frac{|\chi_E(x)-\chi_E(y)|}{|x-y|^{n+s}}\,dx\,dy + 2\int_\Omega \int_{\mathbb{R}^n\setminus\Omega} \frac{|\chi_E(x)-\chi_E(y)|}{|x-y|^{n+s}}\,dx\,dy$$