Ciências ULisboa

# GEOMETRY & PHYSICS

# SEMINAR

## 20 junho | 11:00 | sala 6.2.33

## Euler calculus and its applications

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**Abstract:**
Short version: ``Sometimes [Euler calculus] appears to be useful [...].'' - Oleg Viro

Long version: Euler calculus is the theory of integration of constructible functions with respect to the Euler characteristic. This theory of integration allows for the definition of integral transforms similar to the classical Radon transform. I will present a theorem due to Schapira (1995) that provides sufficient conditions for the invertibility of these transforms. This result is key to the following inverse problem: is a definable set determined by the homology of its intersections with all affine half-spaces?

During the presentation, I will motivate the study of constructible functions in two ways. First, I will state a theorem by Kashiwara (1985) that relates these functions to constructible sheaves. Finally, I will discuss topological invariants due to McCrory and Parusinski (1997) defined using Euler calculus. The vanishing of these invariants is a necessary condition for a topological space to be homeomorphic to an algebraic set.

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