## Fernando Lledó (UC3M - ICMAT)

## Amenability aspects around Roe C\*-algebras

There is a classical mathematical theorem (based on the work by Banach and Tarski) that implies the following shocking statement: "An orange can be divided into finitely many pieces, these pieces can be moved and rearranged in such a way to yield two oranges of the same size as the original one." In 1929 J. von Neumann recognized that one of the reasons underlying the Banach-Tarski paradox is the fact that on the unit ball there is an action of a discrete subgroup of isometries that fails to have the property of amenability ("promediabilidad" in Spanish or "Mittelbarkeit" in German). Since then, the notion of amenability has become ubiquitous in mathematics.

In this talk we will approach the concept of amenability from very different perspectives: we will analyze metric, purely algebraic and operator theoretic aspects. Finally, we will present Roe C\*-algebras associated to discrete metric spaces with bounded geometry as an example where all these approaches unify.

(Joint work with P Ara (UAB), K. Li (U. Copenhagen), J. Wu (U. Muenster) ).