Friday December 1, 2023
Time: 10:30 am - 11:30 am
Speaker: Marco Lenci (Università degli Studi di Bologna, Italy)

Title: Exactness and K-mixing for extensions of dynamical systems, with application to periodic Lorentz gases

Abstract: Exactness and the K-property (a.k.a. K-mixing) are strong ergodic properties whose significance is that a dynamical system progressively loses all information about its initial conditions. These properties were the subject of intense investigation in the second half of last century before being somewhat superseded by the stronger Bernoulli property, which was at the time proved for a number of popular systems, including many billiards. But the Bernoulli property can only be formulated for dynamical systems preserving a finite measure, while exactness and the K-property work equally well in infinite-measure contexts, which partly explains a revived interest in them.
I will present some recent general theorems on the exact or K decomposition of extensions of exact or K dynamical systems. One immediate application is that, in large generality, a recurrent periodic Lorentz gas whose finite-measure factor is proved to be hyperbolic is K-mixing. This includes virtually all previously studied 2-dimensional periodic Lorentz gases and d-dimensional periodic Lorentz tubes, as well as many d-dimensional periodic Lorentz slabs.
Joint work with Daniele Galli.