



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DEPARTMENT OF PHYSICS AND ASTRONOMY
"AUGUSTO RIGHI"

10:00 a.m. - 3:00 p.m.
May 4th 2023

SPEAKERS:

Oliver Butterley

Università di Roma Tor Vergata

Giovanni Canestrari

Università di Roma Tor Vergata

Daniele Galli

Alma Mater Studiorum - Università di Bologna

ORGANIZER:

Marco Lenci

Alma Mater Studiorum - Università di Bologna

SALA RIUNIONI

1st floor

Dipartimento di Fisica e Astronomia "A. Righi"

Via Irnerio, 46 Bologna

FREE ADMISSION

**A one-day mini-workshop
about Transfer Operators
in Dynamical Systems.**

TO Day

PROGRAM

10:00-11:00 a.m.

Giovanni Canestrari, University of Roma Tor Vergata
"Discontinuities cause essential spectrum"

In this seminar we will introduce transfer operators associated to interval transformations and discuss the relation between their spectrum and Ruelle resonances. After that we will show that the essential spectrum of the transfer operator acting on a large class of Banach spaces is large whenever the transformation fails to be Markov. We will compare our results with the literature and finally show how to construct a family of Banach spaces which proves that the lower bound on the essential spectral radius is optimal.

This is joint work with Oliver Butterley and Sakshi Jain.

11:30 a.m. - 12:30 p.m.

Oliver Butterley, University of Roma Tor Vergata
"Discontinuities cause essential spectrum on surfaces"

Two dimensional expanding maps with discontinuities are considered. It is shown that, in the presence of discontinuities, the essential spectrum of the transfer operator is large. In this higher dimensional setting many difficulties are encountered due to the possibility of discontinuities having complicated geometry. Joint with Giovanni Canestrari and Roberto Castorini.

2:00-3:00 p.m.

Daniele Galli, University of Bologna
"A cohomological approach to Ruelle-Pollicott resonances and speed of mixing for Anosov diffeomorphisms"

Given a transitive Anosov diffeomorphism on a closed connected manifold, it is known that, for smooth enough observables, the system is mixing w.r.t. the measure of maximal entropy. Accordingly, it makes sense to investigate the speed of decay of correlations and to look for the so-called Ruelle-Pollicott resonances, in order to determine an asymptotics for the correlation limit.

In this talk I will describe some recent ideas to tackle these questions. In particular, I will point out some connections between the spectrum of a particular transfer operator acting on suitable anisotropic Banach spaces of currents and the spectrum of the action induced by the Anosov map on the De Rham cohomology. As a corollary, we obtain an upper bound for the speed of mixing.