Università
degli Studi
della Campania
Luigi Vanvitelli

AVVISO DI SEMINARIO

Lunedì 12 dicembre 2022, alle ore 14:00, in aula F (ex Psicologia), la Dottoressa Martina Maiuriello terrà un seminario dal titolo

Recent trends in chaotic, linear dynamics

Abstract

The theory of dynamical systems is the mathematical study of the long-term behavior of evolving systems, understood as operators acting on certain spaces. In its early stage, it focused mainly on non-linear systems (i.e., systems generated by non-linear operators), considered more suitable, than the linear ones, to possess strange behaviors and therefore more intriguing from a dynamical point of view. A decisive step in the opposite direction was made in the first half of the 20th century, when studies showed that even linear systems can behave unpredictably and chaotically, leading to the birth of the so called *Linear Dynamics*.

In the talk, in the setting of separable Banach spaces, I will briefly recall some fundamentals of Linear Dynamics (like hypercyclicity, topological mixing, Devaney and Li-Yorke chaos, hyperbolicity, expansivity and shadowing), showing a flurry of intriguing results obtained recently. In particular, in the first part of the talk, the investigation of the mentioned notions will be presented in the context of a versatile class of linear operators, called *composition operators*, the study of which consists in the comparison between the dynamical behaviors of a linear operator $T_f : \varphi \to \varphi \circ f$ and the properties of the transformation f itself. As the dynamics of composition operators are not easy to comprehend, it will be convenient to look for a (semi-)conjugacy with a better-understood operator: this explains why I will briefly introduce the *weighted shifts*, known to be a good model for understanding the dynamics of various complicated operators. New characterizations and advances in this field will be presented and described. In the second part of the talk, I will show that chaotic phenomena can be, surprisingly, very recurrent among linear operators: the "vastness" of chaos will be analyzed both, in the classical sense of Baire and in the modern sense of lineability and spaceability.

Proponente

IL Gruppo di Analisi Matematica