CORSO DI DOTTORATO

Titolo: Sheaves on hyper-Kähler manifolds

Speaker: Alessio Bottini

Period: 6 – 7 – 8 Maggio 2024

Schedule: 25 hours

Lun 06/05/2024 - h.14:30-16:30 Aula 1101 D'Antoni
Mar 07/05/2024 - h.14:30-16:30 Aula 1101 D'Antoni
Mer 08/05/2024 - h.14:30-16:30 Aula 1101 D'Antoni

Abstract:

Constructing hyper-Kähler manifolds is a hard problem. Up to deformation, all the known examples are built from moduli spaces of stable sheaves on a K3 (or abelian) surface. It is natural to wonder if moduli spaces of sheaves on high dimensional HK manifolds could be HK themselves. Already thirty years ago, Kobayashi and Verbitsky studied vector bundles on HK manifolds, and noticed that they have symplectic moduli spaces. Unfortunately, while on K3 surfaces the theory is well-understood, in high dimension it is much harder, and for now, we can handle only very special cases.

In this course, I will describe the state of the art of the theory of sheaves on HK manifolds, focusing especially on the recent developments due to the works of Beckmann, Markman and O'Grady. I will start with a review of sheaves on K3 surfaces, and I will try to highlight the important properties which we want to generalize. Later, I will discuss the various classes of sheaves on HK manifolds, which emerge by trying to generalize from K3 surfaces. Lastly, I will discuss some explicit examples in dimension four.