



In the framework of the activities of the PhD programme in Mathematical Sciences

Dr. **Salvatore Stuard**

University of Milan

will offer a PhD course on

## **An introduction to the mean curvature flow and its regularity theory**

### **Abstract**

This course is dedicated to the analysis of the Mean Curvature Flow (henceforth abbreviated MCF), one of the most important geometric evolution equations. After motivating its introduction and illustrating several examples, I will present some classical results concerning the short-time existence of smooth solutions and their properties. Then, I will investigate the nature of the singularities of solutions to the MCF and of the corresponding blow-up profiles. Finally, I will present a proof of a partial regularity result, which provides, under certain geometric assumptions, an estimate of the size of the singular set at the first time when singularities appear. The course will be of introductory nature and self-contained. Nevertheless, many of the techniques which I will present are powerful enough to be employed even in the study of weak solution concepts of MCF (e.g. Brakke flow). Moreover, the approach I will follow shares many similarities with that adopted for other problems in Geometric Analysis, such as the study of singularities of minimal surfaces and harmonic maps, and I will draw the relevant connections whenever possible.

### **Scheduling**

The course will be held at the Department of Mathematics, Via C. Saldini n.50 – Milano

**from 8 February to 15 March 2023, from 2.00 pm to 4.00 pm**

with the following scheduling:

**8, 10, 13, 14, 27** February and **1, 6, 10, 13, 15** March

Room: **Aula Dottorato**, 1st floor