



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

Prof. **Chiara Saffirio**

Universität Basel

will offer a PhD course on

## **Particle systems and scaling limits in kinetic theory**

### **Abstract**

A major question in non-equilibrium statistical mechanics concerns the rigorous derivation of effective macroscopic equations from the microscopic laws of classical and quantum mechanics, whose mathematical interest goes back to Hilbert's 6th problem.

This series of lectures aims at addressing the derivation problem for the two prototype models of kinetic equations (namely the Vlasov and the Boltzmann equations), reviewing the classical and most recent mathematical techniques in the field, ranging from optimal transport to BBGKY hierarchy, from stochastic particle systems to geometric analysis of certain pathological sets. Recent progresses, open questions and possible research directions will be addressed towards the end of the course.

### **Scheduling**

The course will be held at the Department of Mathematics, Via C. Saldini n.50 – Milano  
**from 17 January to 2 February 2023** with the following scheduling:

Tuesday **17**, 2:00 pm - 4:00 pm  
Wednesday **18**, 10:00 am - 12:00 pm and 2:00 pm - 3:00 pm  
Thursday **19**, 10:00 am - 12:00 pm and 2:00 pm - 3:00 pm  
Monday **30**, 2:00 pm - 4:00 pm  
Tuesday **31**, 10:00 am - 12:00 pm and 2:00 pm - 3:00 pm  
Wednesday **1**, 10:00 am - 12:00 pm and 2:00 pm - 3:00 pm  
Thursday **2**, 10:00 am - 12:00 pm

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