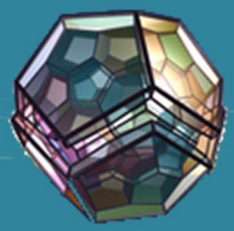

DOCTORAL PROGRAMME IN MATHEMATICAL SCIENCES

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

Prof. **Adrian Muntean**

Karlstad University, Sweden

will offer a PhD course on

Two-scale Convergence Homogenization Techniques and Multiscale Modeling

Abstract

The ultimate aim is provide the PhD student with powerful tools developed in the last decades in the field of asymptotic analysis, from the viewpoint of weak convergence methods for PDEs. Such modern theory will help to formulate and then solve own research-relevant questions. Most parts of the world around us can be described surprisingly well in terms of evolving-in-time mathematical objects(typically balance equations for PDEs, SDEs, etc.). Sometimes, such abstract objects can be computed numerically allowing for quantitative predictions, if sufficient assumptions are met. Having in mind as leading examples reactive porous media and composite materials with active microstructures, the message the course wishes to convey is that asymptotic analysis applied to ordered structures, referred here as homogenization-based techniques, is able to provide very useful approximate model equations and concrete expressions for their parameters, coupling intimately microscopic to macroscopic information and fairly easy to compute. Moreover, a correct coupling among the spatial scales facilitates further interpretation of a priori unreachable microscopic information in terms of accessible macroscopic experiments.

Scheduling

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

from 19 to 28 February 2024

with the following scheduling:

Monday **19**, hours 2.00 PM – 5.00 PM – Room: Sala di Rappresentanza

Tuesday **20**, hours 2.00 PM – 5.00 PM – Room: Aula dottorato

Wednesday **21**, hours 2.00 PM – 4.00 PM – Room: Aula 10

Monday **26**, hours 2.00 PM – 5.00 PM – Room: Sala di Rappresentanza

Tuesday **27**, hours 2.00 PM – 5.00 PM – Room: Aula dottorato

Wednesday **28**, hours 8.00 AM – 10.00 AM – Room: Aula dottorato