

**Programme on
“Nonlinear Flows”
May 30 – July 15, 2016**

organized by

Eduard Feireisl (Czech Academy of Sciences, Prague), Ansgar Jüngel (TU Vienna), Alexander Mielke (WIAS, Berlin), Giuseppe Savaré (U Pavia), Ulisse Stefanelli (U Vienna)

**Mini-Course 6
“Fluid models for collective dynamics”
by Pierre Degond, Imperial College
July 6 – 7, 2016**

- **Wednesday, July 6, 2016**

10:00 – 12:00 **Pierre Degond**

Fluid models for collective dynamics: Lecture 1

- **Thursday, July 7, 2016**

10:00 – 12:00 **Pierre Degond**

Fluid models for collective dynamics: Lecture 2

All talks take place at the ESI, Boltzmann Lecture Hall!

Abstract: Collective dynamics appears ubiquitely in nature, from bird flocks to the swimming of sperm. Collective dynamics creates emergent patterns at a scale orders of magnitude larger than those of the individual agents. The deciphering of the mechanisms underpinning the emergence of these large scale structures requires the ability to coarse-grain the models from the particle scale to the population scale. In this series of lectures we will explore some of the mathematical difficulties that arise when trying to coarse-grain particle models of collective dynamics and that contribute to the forging of new mathematical tools in kinetic theory.