Plenary course	**A gentle introduction to combinatorial stochastic processes (with applications to Physics, Finance and Economics)**
Lecturer	**Enrico Scalas**, University of Sussex
Textbook	U. Garibaldi, E. Scalas, Finitary Probabilistic Methods in Econophysics, Cambridge University Press, 2010.

Outline:

The theme of this course is the allocation of n objects (or elements) into g categories (or classes), discussed from several viewpoints. This approach can be traced back at least to the early work of 24-year-old Ludwig Boltzmann in his first attempt to derive Maxwell's distribution of velocity for a perfect gas in probabilistic terms. We shall start from descriptions of the world as facts (taking place or not), and events as propositions (true or not) about facts (taking place or not). Not everything in the world is known, and what remains is a set of possibilities. For this reason, events can be probabilized and probability theory plays a fundamental, but often underestimated, role in our scientific theories. Indeed, it turns out that many important problems in statistical physics and some problems in economics and finance can be formulated and solved using these methods.

Syllabus: The following topics will be addressed

Individual and statistical descriptions
The Pólya urn process
The Ehrenfest–Brillouin model
Applications to statistical physics
Applications to stylized models in economics and finance
The Ewens sampling formula
The Zipf–Simon–Yule process

The theoretical material will be complemented by computer-based sessions on Monte Carlo simulations of the processes and models introduced in the course.