



## Cours de Physique Théorique de l'IPhT, année 2010-2011

Organisé en collaboration avec

Ecole Doctorale de Physique de la Région Parisienne - ED 107

### ***Exploring Nonequilibrium Statistical Mechanics with Driven Diffusive Systems***

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Vendredi 20/5/2011 à 10h00, **mardi** 24/5 à 14h15, vendredi 27/5 à 10h00. (Seminaire associé : **mardi** 17/5 à 11h00.)

The goal of this set of lectures is to provide an introduction to Driven Diffusive Systems (DSS), which form a significant part of explorations into far-from-equilibrium statistical mechanics. With detailed balance violating “microscopic dynamics”, such systems often display counter-intuitive phenomena, even when they have settled down into stationary states. Designed for students, these lectures may be regarded as a “tour guide” of DDS, rather than a set of “operator’s manual” for specific problems. The main emphasis will be overviews, key results, unsolved puzzles, and outlooks, as opposed to mathematically rigorous, technical details. The associated colloquium (to be held at IPhT Tuesday, May 17 at 11h00) can be considered as an integral part of these lectures, serving as a “preface” or an “appetizer.”

The tentative topics are:

- Equilibrium vs. non-equilibrium statistical mechanics: The context of DDS.
- An Ising-like model in DDS: Physics beyond common expectations and surprises at all temperatures.
- DDS in one-dimension: Exact solutions and generalizations appropriate for protein synthesis.
- DDS with two species of particles, driven in opposite directions: Remarkable behavior in two-dimensional and quasi one-dimensional systems.

**Lieu** : IPhT, CEA Saclay, Orme des Merisiers, Bât. 774, p.1A Salle C. Itzykson.

**Accès** : Par lignes de bus publics (269.02 et 91.06).

**Renseignements** : <http://ipht.cea.fr> ou [ipht-lectures@cea.fr](mailto:ipht-lectures@cea.fr)