Grupo de Física Matemática
da Universidade de Lisboa

SEMINÁRIO DE FÍSICA-MATEMÁTICA

Dia **17 de Junho de 2008** (terça-feira), às **14h30m**, na **Sala B1-01**

"Bernstein processes and optimal transport"

Christian Léonard
(Univ. Paris 10, Nanterre, France)

Abstract

Consider a large number n of particles living in some state space $\mathcal{X}$ performing independent random paths during the time interval $[0, T]$. At time 0 you observe a profile of their configuration close to some probability distribution $\mu \in \mathcal{P}(\mathcal{X})$ and at the later time T you observe that their profile is close to some $\nu \in \mathcal{P}(\mathcal{X})$.

If $(P_t)_{0 \le t \le T}$ is the semigroup associated with the dynamics of each particle, by the law of large numbers one expects to find the system with a profile close to μP_t at a later time t. Suppose that ν differs from μP_T. This unexpected event is a large deviation from the prediction of the law of large numbers and is very rare as n is large. In 1932, Erwin Schrödinger [1] addressed the problem of finding the most likely path of the whole particle system, knowing that its initial and final profiles are respectively close to μ and ν. He gave the answer to this large deviation problem.

It will be shown that in the double limit of a large number n of particles and of vanishing fluctuations, the most probable path of the system solves some optimal transport problem.

References

[1] E. Schrödinger. Sur la théorie relativiste de l'électron et l'interprétation de la mécanique quantique. *Ann. Inst. H. Poincaré*, 2:269–310, 1932.

Local:
COMPLEXO INTERDISCIPLINAR DA UNIVERSIDADE DE LISBOA
Av. Prof. Gama Pinto, 2
1649-003 Lisboa, Portugal