Inference of DNA sequence from mechanical unzipping data

A postdoctoral position in theoretical physics/biophysics is available at the Ecole Normale Superieure (Statistical Physics (LPS) and Theoretical Physics (LPT) Laboratories) in the framework of a joint program between theoretical physicists (S. Cocco (LPS-ENS) and R. Monasson (LPT-ENS)) and experimental physicists (U. Bockelmann - ESPCI) on extracting information on DNA sequences from unzipping experiments. U. Bockelmann and his group have done a pioneer work in showing that when the two strands of a DNA molecule are moved apart at a constant displacement rate the opening force signal is correlated to the sequence content of the DNA molecule. The unzipping of the DNA is however affected by thermal noise and therefore the force signal is stochastic. It can be modeled by a random walk of the opening fork in a unidimensional random potential due to the sequence content. The post-doc project aims at infering the sequence content from the statistical analysis of the opening force signal. In particular the optimal experimental protocol to extract information about the sequence as well as the practical implementation of inference algorithms will be investigated, and applied to experimental data.

To have more information please contact:

Simona Cocco  
Laboratoire de Physique Statistique  
Ecole Normale Superieure  
24 rue Lhomond 75005 Paris France  
cocco@lps.ens.fr  
www.lps.ens.fr/~cocco