



Du  
**08**  
DÉC.  
2023

10h30  
-  
12h30

## **SÉMINAIRE MATRICES ET GRAPHS ALÉATOIRES**

**Mini-Cours: Disordered Ising chains and products of random transfer matrices.**

Salle Mirzakhani (201)

INSCRIPTION

Abstract: it is well known (and rather elementary, as we will explain) that the partition function of the Ising chain can be expressed in terms of products of 2 by 2 matrices. In particular the free energy density of the model is just the leading eigenvalue of the transfer matrix if the model is homogeneous. In presence of disorder, the transfer matrix structure is still available, but one deals with products of random (still 2 by 2) matrices and, in particular, the free energy density is, in this inhomogeneous setting, the leading Lyapunov exponent of the matrix product. The aim of the lecture is to introduce the transfer matrix formalism and analyze both the singular behavior of the free energy density in the strong interaction limit and the behavior of the configurations of the system in this limit. The presentation will be mostly restricted to the case in which the external field is centered: this is both for time reasons and because the understanding of the centered case is much more advanced. The final aim is to show that the results that we will present (hopefully, with some ideas from the proofs) confirm predictions made in the physics literature by applying a renormalization group procedure introduced by D. Fisher in the 90s.

URL of the page: <https://www.ihp.fr/fr/agenda/mini-cours-disordered-ising-chains-and-products-random-transfer-matrices>



## **INSTITUT HENRI POINCARÉ - UAR839**

Sorbonne Université / CNRS  
11 rue Pierre et Marie Curie  
75231 Paris Cedex 05

### **HORAIRES**

L'institut :

- lundi au vendredi de 8h30 à 18h,
- fermé les jours fériés.

Le musée - Maison Poincaré :

- lundi, mardi, jeudi et vendredi de 9h30 à 17h30,
- samedi de 10h à 18h,
- fermé le mercredi et le dimanche.