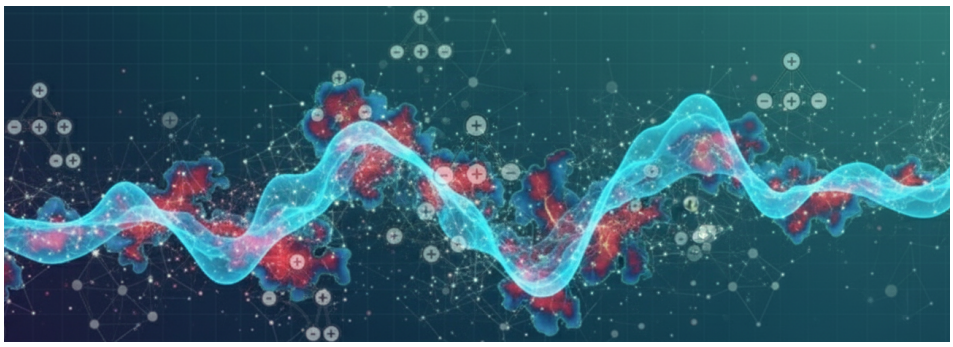
Mesures de Gibbs, Turbulence d'onde et EDP stochastiques



Rapport sur les contributions

https://indico.math.cnrs.fr/e/15230

ID de Contribution: **1** Type: **Non spécifié**

Tony Lelièvre

lundi 15 décembre 2025 11:00 (45 minutes)

ID de Contribution: **2** Type: **Non spécifié**

Mickaël Latocca : Gibbs measure for NLS on the 2 sphere, part I

lundi 15 décembre 2025 13:45 (45 minutes)

Orateur: LATOCCA, Mickaël (Ecole Normale Supérieure (DMA), PSL Research University)

ID de Contribution: **3** Type: **Non spécifié**

Nicolas Camps : Gibbs measure for NLS on the 2 sphere, part II

lundi 15 décembre 2025 14:40 (45 minutes)

ID de Contribution: **4** Type: **Non spécifié**

Antoine Mouzard : Anderson Φ^4_2 and stochastic quantization

lundi 15 décembre 2025 16:00 (45 minutes)

ID de Contribution: **5** Type: **Non spécifié**

Quentin Chauleur : Wave turbulence and Kolmogorov spectra

mardi 16 décembre 2025 10:25 (45 minutes)

In this introductory talk I will sketch the derivation of the wave kinetic equation, with a particular emphasis on Kolmogorov-Zhakarov spectra wich appear as particular stationary states of the system. I will also show some classical results on energy transfer mechanisms in Hamiltonian nonlinear dispersive models, alongside numerical simulations.

ID de Contribution: **6** Type: **Non spécifié**

Katja Vassilev : One-dimensional wave-kinetic theory

mardi 16 décembre 2025 11:20 (45 minutes)

Abstract: Wave kinetic equations have been rigorously derived up to the kinetic timescale from dispersive systems in dimension $d \geq 2$. In this talk, we address the question of deriving kinetic equations in dimension one. Similar to higher dimensional models, one may expand the solution into iterates, represented by Feynman diagrams. However, the combinatorial estimates needed to bound these diagrams are much worse in dimension one, leading to some of these diagrams diverging at times much shorter than T_{kin}. We explain this phenomena for the MMT (Majda, McLaughlin, and Tabak) model, a 1D model encompassing a range of dispersion relations, including the case of the 1D NLS. In this case, the kinetic equation is trivial, so we will discuss the question of what the appropriate kinetic theory could be in this setting.

ID de Contribution: **7** Type: **Non spécifié**

Angeliki Menegaki : On the stability of Rayleigh–Jeans solutions for FPUT

mardi 16 décembre 2025 13:45 (45 minutes)

ID de Contribution: **8** Type: **Non spécifié**

Ricardo Grande : Extreme waves and large deviations for 2D pure gravity deep water waves

mardi 16 décembre 2025 14:40 (45 minutes)

We study the formation of extreme waves from a statistical viewpoint in the context of the pure gravity water wave equations in deep water. We quantify their probability under random Gaussian sea initial data up to the optimal timescales allowed by deterministic well-posedness theory. The proof shows that rogue waves most likely arise through "dispersive focusing", where phase synchronization produces constructive amplification of the water crest. The main difficulty in justifying this mechanism is propagating statistical information over such long timescales, which we overcome by combining normal forms and probabilistic methods. Unlike previous results, this novel approach does not require approximate solutions to be Gaussian. This is a joint work with M. Berti, A. Maspero and G. Staffilani.

ID de Contribution: **9** Type: **Non spécifié**

Annalaura Stingo : Trivial resonances for a system of Klein-Gordon equations and applications in wave turbulence

mardi 16 décembre 2025 16:00 (45 minutes)

ID de Contribution: **10** Type: **Non spécifié**

Charles-Edouard Bréhier : Some structure-preserving schemes for SPDEs

mercredi 17 décembre 2025 09:00 (45 minutes)

I will present several topics on numerical methods for SPDEs, where standard schemes do not preserve important qualitative features of the solution. Precisely, I will show the construction and analysis of positivity, regularity and asymptotic preserving schemes for some SPDEs.

ID de Contribution: **11** Type: **Non spécifié**

Arnaud Debussche : Stochastic primitive equations with transport noise and weak hydrostatic assumption

mercredi 17 décembre 2025 09:55 (45 minutes)

We investigate the convergence of solutions of a stochastic 3D Navier-Stokes equations to those of the primitive
equations. We explore the impact of relaxing the hydrostatic assumption in the stochastic primitive equations by
retaining martingale terms as deviations from hydrostatic equilibrium. This modified model, obtained through a
specific asymptotic scaling accessible only within the stochastic framework, captures non-hydrostatic effects while
remaining within the primitive equations formalism. We prove that it provides a higher-order approximation of the 3D
stochastic Navier-Stokes equations.

ID de Contribution: **12** Type: **Non spécifié**

El Mehdi Haress

mercredi 17 décembre 2025 11:10 (45 minutes)

ID de Contribution: **13** Type: **Non spécifié**

Katharina Schratz : Resonances as a computational tool

mercredi 17 décembre 2025 12:05 (45 minutes)