## Mathematics and CS Seminar

# Gibbs measures in infinite dimensions - Some new results on a classical topic


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Gibbs measures on spaces of functions or distributions play an important role in various contexts in mathematical physics. They can, for example, be viewed as continuous counterparts of classical spin models such as the Ising model, they are an important stepping stone in the rigorous construction of Quantum Field Theories, and they are invariant under the flow of certain dispersive PDEs, permitting to develop a solution theory with random initial data, well below the deterministic regularity threshold. These measures have been constructed and studied, at least since the 60s, but over the last few years there has been renewed interest, partially due to new methods in stochastic analysis, including Hairer's theory of regularity structures and Gubinelli-Imkeller-Perkowski's theory of paracontrolled distributions. In this talk I will present two independent but complementary results that can be obtained with these new techniques. I will first show how to obtain estimates on samples from of the Euclidean $\phi^4_3$ measure, based on SPDE methods. I will then discuss a new method to show the emergence of phase transitions in the phi^4_3 theory. This is based on joint works with A. Chandra, A. Moinat https://arxiv.org/abs/1910.13854 and A. Chandra, T. Gunaratnam https://arxiv.org/abs/2006.15933


**Tuesday, October 20, 2020 04:30pm - 05:15pm**

Online via Zoom

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