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**UNIVERSITÄT
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ZUKUNFT
SEIT 1386

STRUCTURES JOUR FIXE

HENDRIK WEBER

Department of Mathematical Sciences, University of Bath

“Interacting Particle Systems and
stochastic PDEs”

April 29, 2022 1:30 PM

Coffee & snacks in room 106 at 1:00 PM and afterwards

**HYBRID: Great lecture hall in Philosophenweg 12 and
Zoom. Meeting ID: 935 6549 3662, Code: 928036
Contact: office@structures.uni-heidelberg.de**



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ABSTRACT

It is well known that the large scale behaviour of many interacting particle systems can be efficiently described using a non-linear PDE, the so-called hydrodynamic limit. Next order corrections around this limit are typically Gaussian and given by a linear stochastic PDE.

There are however specific situations, e.g. near an onset of instability of the hydrodynamic limit, where non-Gaussian fluctuations / non-linear SPDEs arise. In this talk I will discuss one such example, the rigorous derivation of the dynamic ϕ^4 model from the Glauber dynamics of the Kac-Ising model in 1,2 and 3 dimensions.

A major challenge in establishing this convergence rigorously is to even define the limit, particularly in the 3-dimensional case. This will be done using Hairer's theory of regularity structures.

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