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OBERSEMINAR IM INSTITUT FÜR ANGEWANDTE ANALYSIS

Wintersemester 2025/26

Im Rahmen des Oberseminars spricht am Montag, den **24. November 2025**:

JONAS KOEPPL

Weierstraß Institute Berlin

Spontaneous time-symmetry breaking in interacting particle systems.

We study the long-time behaviour of interacting particle systems on the integer lattice $\mathbb{Z}^d$ with a focus on symmetries. In particular, we are interested in spontaneous symmetry breaking, i.e., situations where there are stationary measures that satisfy less symmetries than the transition rates themselves. Classical examples include the Glauber dynamics for the Ising model, where the global spin-flip symmetry is broken in dimensions $d \geq 2$ and the translation-symmetry is broken in dimension $d \geq 3$. In this talk, we discuss the possibility of a spontaneous breaking of the time-symmetry, i.e., whether an interacting particle system with time-homogeneous rates can admit time-periodic behaviour. While this can easily be ruled out in finite volume, the situation is much more delicate in the thermodynamic limit. We provide a no-go theorem under the additional assumption of reversibility and exhibit examples of non-degenerate interacting particle systems which do indeed exhibit spontaneous time-symmetry breaking.

Der Vortrag findet in **Raum E.60, Helmholtzstr. 18** statt.

Beginn: 16 Uhr (c.t.). Alle Interessierten sind herzlich eingeladen.

W. Arendt, A. Dall'Acqua, A. Schlichting, R. Zacher.