

Theoriekolloquium

Am **12. Januar 2023** um **14.15 Uhr** im Raum **W2 1-143** hält

Herr Prof. Dr. Martin Weigel (TU Chemnitz)

einen Vortrag mit dem Titel

Ising and Potts models in a random field: results from (quasi-)exact algorithms

Impurities and disorder are omnipresent in condensed-matter systems in the laboratory. Their effects are especially pronounced in the vicinity of phase transitions, such as the liquid-gas or ferromagnetic ordering transitions. Due to large fluctuations and slow dynamics, the study of such systems with the help of computer simulations often is particularly challenging. Magnets with frozen-in impurities are among the hardest known computational problems, where the time taken to find the low-energy states doubles with every added lattice site. As a result, computational studies of relevant system sizes are normally prohibitively difficult. With a method adapted from the problem of automatically dividing an image into adjacent uniformly colored areas - a standard task in machine vision - it is now possible for the first time to study in depth a general class of magnetic systems with multiple local states. Their magnetic ordering at low temperatures shows a previously unseen new behavior that is expected to apply to a whole class of systems ranging from magnetic to soft matter and even to glassy systems. In this seminar, I will provide an introduction into the use of combinatorial optimization algorithms for solving problems in disordered systems in condensed matter, leading the discussion from very well-studied cases such as the random-field Ising model to recent advances in the field for systems with more than two spin orientations.

Interessierte sind herzlich eingeladen.

gez. Prof. Dr. Alexander Hartmann