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To all members of the
Faculty of Physics

Vienna, 26. April 2024

Invitation to the public defense of the doctoral thesis

**“Of barriers and pathways: Understanding rare event
mechanisms and their connection to system dynamics”**

by

Clemens Moritz

Friday, 03 May 2024, 10:15 a.m.

Ludwig-Boltzmann-Lecture Hall, ground floor, Boltzmanngasse 5, 1090
Vienna

Rare events, such as the formation of an ice crystal in undercooled water, are ubiquitous in nature. While computer simulations of such processes are often challenging, they also offer a unique window for insights due to the amount of control and detail they can provide. In this defense, I present studies of three different rare event systems: the disk-to-slab transition in the 2d Ising model that leads us to a nuanced understanding of the role of dynamics in a rare event's mechanism; the merging of two parallel fluctuating interfaces that we describe using a partial differential equation in order to understand how the dynamics of the system play together as it is scaled; and the melting of an ice crystal, where we provide a comprehensive analysis of the defects that are involved in different stages of the process and how they interact to form a liquid nucleus.

Defense committee:

Gabriele C. Sosso, University of Warwick, UK (reviewer)

Fabio Pietrucci, Sorbonne Université, FR (reviewer)

Christoph Dellago (supervisor)

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