Stuttgarter Physikalisches Kolloquium

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Max-Planck-Institut für Intelligente Systeme
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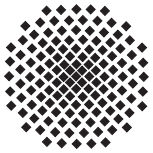

Dienstag, 17. Juli 2018 | **17.15 Uhr** | **Hörsaal 2 D5**

Stuttgarter Max-Planck-Institute, Heisenbergstraße 1, 70569 Stuttgart-Büsnau

Ordered fluctuations: vestigial order in quantum materials

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Abstract

A hallmark of the phase diagrams of quantum materials is the existence of multiple electronic ordered states. In many cases those are not independent, competing phases, but instead display a complex intertwinement. In this talk, we focus on a realization of intertwined orders with a fluctuation-driven vestigial phase characterized by a composite order parameter. In other words, we are investigating the order of fluctuations.

We demonstrate that this concept naturally explains the nematic state in iron-based superconductors and nematic superconductivity in doped topological insulators. In addition we propose a natural mechanism for charge 4e superconductivity with half flux quanta. We present a formalism that provides a framework to understand the complexity of quantum materials based on symmetry, largely without resorting to microscopic models.