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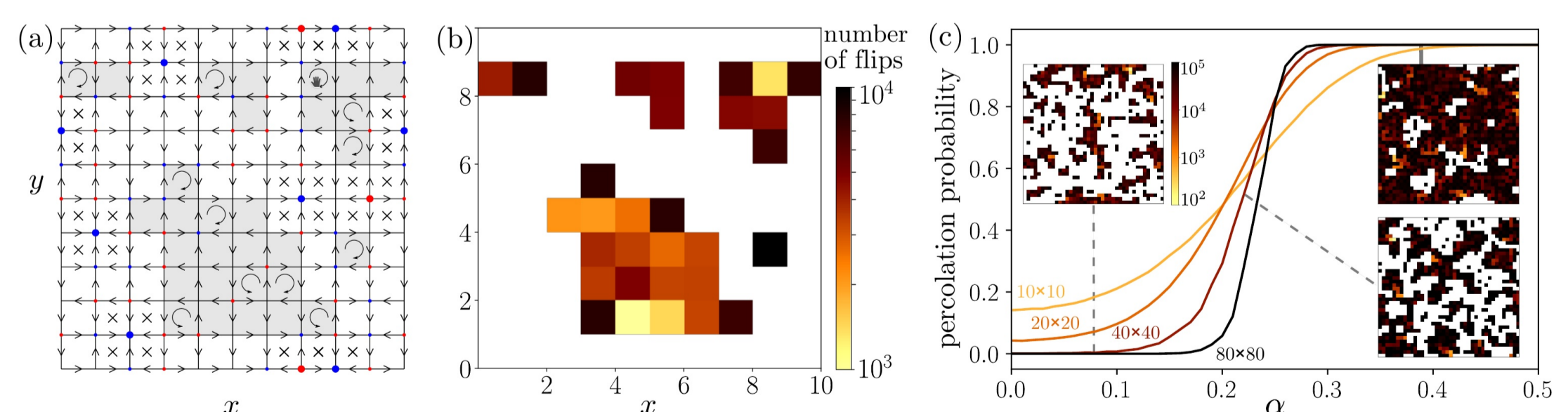
## Disorder-free localization in lattice gauge theories

# physikalisches

Mo. 2.5.22  
16:00 Uhr  
Ort: H34 &  
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Gauge theories play an interdisciplinary, fundamental role in physics, ranging from the study of elementary particles all the way to strongly correlated and topological quantum matter. While their equilibrium properties have been explored extensively for decades, their nonequilibrium quantum real-time dynamics has attracted significant attention recently, driven particularly by strong experimental efforts in so-called quantum simulators.

In this talk I will show how the inherent local gauge symmetries can impose such a strong constraint so that lattice gauge theories exhibit a new form of localization without the need of disorder, so that excitations can only propagate over finite distances. I will discuss the consequences on the physical properties of such disorder-free localized lattice gauge theories and outline the potential to realize new phase structures both in quantum simulators and solid state systems.



Disorder-Free Localization in an Interacting 2D Lattice Gauge Theory - P. Karpov, R. Verdel, Y.-P. Huang, M. Schmitt, and M. Heyl - Phys. Rev. Lett. 126, 130401 – Published 1 April 2021 - DOI:<https://doi.org/10.1103/PhysRevLett.126.130401>