Universität Bielefeld Fakultät für Physik

Condensed Matter Theory

# Seminar


## Conor Bradley

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## 15:00 Many-body-localized discrete time crystal with a programmable spin-based quantum simulator


Interacting spin systems in the solid state provide a rich testbed for quantum science and the exploration of many-body physics. I will introduce an experimental platform based upon a register of 27 13C nuclear spins coupled to a single NV centre in diamond and explain how we realise a high degree of control over individual qubits within the system [1,2]. I will then discuss our use of this system as a programmable quantum simulator, leading to the first experimental observation of a many-body-localised discrete time crystal [3,4].


[1] C. E. Bradley, J. Randall et al., Phys. Rev. X 9, 031045 (2019); [2] M. H. Abobeih et al., Nature 576, p 411415 (2019); [3] J. Randall, C. E. Bradley et al., Science 374 (2021); [4] M. Ippoliti et al., PRX Quantum 2, 030346 (2021)


## Thursday, 05.05.2022, 15:00 Uhr
## Zoom