CRC 1227
Designed Quantum States of Matter

GUEST LECTURE

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(Guest of Prof. Tobias Osborne and Prof. Klemens Hammerer)

Leibniz Universität Hannover
DQ-mat Colloquium
29 July 2021, 4.00 pm
(via Zoom-Meeting)

"Computationally Universal Phase of Quantum Matter"

My work is on foundational aspects of quantum computation. I begin by explaining where this research is situated in quantum information science overall, and what such investigations may lead to. I will then move on to describe one form such questions may take, namely ``computational phases of quantum matter''.

In the technical part of my talk I describe an (the first) example of a symmetry protected quantum phase that has universal computational power. This two-dimensional phase is protected by one-dimensional linelike symmetries that can be understood in terms of the local symmetries of a tensor network. These local symmetries imply that every ground state in the phase is a universal resource for measurement-based quantum computation.

Joint work with: Cihan Okay, Dongsheng Wang, David Stephen, Hendrik Poulsen Nautrup, J-Ref: PRL 122, 090501 (2019)

All DQ-mat members and all interested are cordially invited to attend.