WEDNESDAY
June 4th, 2025, 12:00 PM
Building E2 6, Room E.11
Everyone is welcome!

Quantum Information Science Talks

UNIVERSITÄT DES SAARLANDES

Prof. Dr. Sevag Gharibian

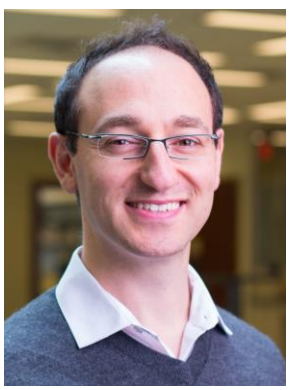
Paderborn University

Hardness of approximation for quantum problems

Wednesday, June 4th, 2025 at 12:00 PM
Building E2 6, Room E.11

The 20th century bore witness to three landmark discoveries in theoretical computer science concerning classifying the difficulty of a given computational problem: The existence of uncomputable problems, the theory of NP-completeness, and the theory of hardness of approximation via the PCP theorem. While the former pair of these have found "analogues" in quantum complexity theory, the question of a quantum PCP theorem remains unfortunately wide open. In this talk, we will first discuss basic concepts in hardness of approximation for a general audience, along with the status of the quantum PCP conjecture. We will then show how to bypass the quantum PCP conjecture and nevertheless obtain hardness of approximation results for problems ranging from minimizing the depth of Variational Quantum Circuit Ansätze to estimating the amount of entanglement in a local Hamiltonian's ground state. No background in quantum complexity theory is assumed.

Based on joint works with Lennart Bittel (FU Berlin), Carsten Hecht (Paderborn), Martin Kliesch (Hamburg UT).



Contact: peter.orth@uni-saarland.de
giovanna.morigi@physik.uni-saarland.de

Website: www.uni-saarland.de/fachrichtung/physik/veranstaltungen/qis-seminar.html