Quantum Information Science Talks

UNIVERSITÄT DES SAARLANDES

Monday
July 14, 2025, 12:00 PM
Building E2 6, Room E.11
Everyone is welcome!

Prof. Dr. Jakob Kottmann

Augsburg University

Bridging Quantum and Classical Algorithmics

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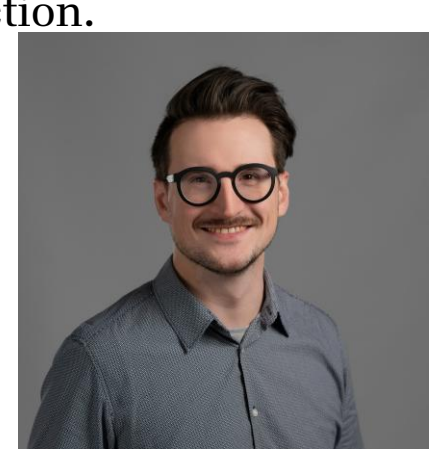
One of the key applications of quantum computation remains simulating nature itself. A key domain is the electronic structure problem in quantum chemistry, which aims to compute electronic eigenstates and their associated properties. Finding an electronic ground state is already considered an intractable task, and efficient (classical and quantum) algorithms for general instances of the problem are not expected to exist. Heuristics are, therefore, essential for the development of applicable computational methods. Moreover, the successful computation of molecular properties requires multiple computations, starting from the discretization of the original problem and ending with the evaluation of expectation values on determined approximations of the discretized eigenstates. To progress to scalable and applicable approaches, three major algorithmic problems need to be addressed: Circuit design, qubit reduction and measurement reduction.



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