



Thursday, May 19, 2022, 16:15, Hybrid Colloquium: EW 202 & [Zoom](#)

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Theoretical challenges in quantum computation

Quantum computers promise solutions for important computational problems that are too difficult to be practically solved by conventional computation. Example problems come from quantum chemistry and material science and prominently include factoring of large integer numbers. This talk will start with an introduction to the topic and a discussion of the latest developments. Then, several theoretical challenges that lie ahead will be highlighted. One particular challenge is to verify the proper functioning of quantum devices and to accurately characterize their components from measurement data. As an example for addressing these challenges, quantum gate set tomography will be discussed. It allows to obtain a tomographic description of an entire very small quantum computer or a subpart of a larger one, as given by a set of quantum gates, initial state and readout. We will see some recent progress made by combining ideas from different areas of applied mathematics and machine learning.

Room EW 202 and Zoom Room:

<https://tu-berlin.zoom.us/j/61801327201?pwd=bno1UytVNGZ4TldNejFtQVZyVGFjZz09>

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