Trapped ion quantum computing

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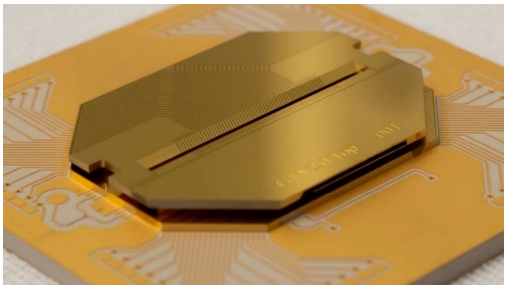
My talk introduces quantum computing with trapped ions and then focusses on the shuttle-base approach. I am discussing the compilers, which transform an incoming quantum circuit into a sequence of single and two-qubit gate operations and the shuttle operations on the trapped ion quantum register. I discuss specific advantages of different architectures and show how a versatile 3D sculpturing can be used to realize trapping structures, which realize such architectures. Finally, I sketch test cases which we have run on the quantum computer. This includes building blocks of quantum error correction, hybrid quantum/classical computation such as variational eigensolver and a machine learning process.



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