Chemistry in the Age of Quantum Computers

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Digital computers have been used for applications to chemistry almost as long as they've existed. Similarly, quantum computation is expected to have significant implications for understanding chemistry. In this talk, I will give an overview of our contributions to this nascent field over the past few years. This will include an introduction to simulation primitives and algorithmic improvements, our long term considerations for quantum mainframes, and a few experimental collaborations resulting in proof-of-principle demonstrations. Finally, I will give some indications of our current research directions.

Biography

James Daniel Whitfield was born and raised in Laurel, Maryland. He obtained his BS in mathematics and chemistry in 2006 from Morehouse College. His PhD was in Chemical Physics at Harvard University with thesis: "At the intersection of quantum computing and quantum chemistry." Since 2012, he has been at the Vienna Center for Quantum Science and Technology as one of the inaugural VCQ Prize Postdoctoral Fellows. His research interests revolve around quantum chemistry, condensed matter physics and computational complexity.