

Thursday, April 18, 2024

Refreshments at 3:15pm outside PSF 101
Colloquium from 3:30pm - 4:30pm in PSF 101

Quantum Information Meets Condensed Matter

Professor Alexander Kemper

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Abstract:

Quantum computing has the potential to help us overcome the barriers that are presented by the end of Moore's law. In the natural sciences, these barriers appear as limitations in computer memory and/or processing speed which prevent scientists from describing the problem fully and forcing them to work on smaller models or with approximate methods. Since nature is fundamentally quantum, it is quite natural to view a quantum computer as a bespoke quantum simulator, where we can examine the open problems in science at a scale not possible with classical computers. In this talk, I will present how this is achieved, and discuss some of our recent work in this area. I will outline how bringing the perspective of a condensed matter physicist into the realm of quantum information can help make quantum algorithms for simulation of many-body physics better, and even usable on today's quantum computers.

Biography:

Dr. Kemper received his PhD in Physics in 2010 from the University of Florida. He spent 2 years as a postdoctoral research at Stanford University and SLAC National Laboratory followed by serving as an Alvarez Fellow at Lawrence Berkeley National Laboratory before joining the faculty at NC State in 2015 as an assistant professor. In the past few years, Lex has started working in quantum computing and quantum information. His particular interest lie at the intersection of Quantum Computing and Condensed Matter Physics, where he is investigating how quantum computers can be used to solve problems in condensed matter.

Host: Prof. Robert Kaindl

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