Holy Cross College Physics Colloquium

Haberlin 219, 4:00 PM

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Long Range Pairing Under a Quantum Gas Microscope

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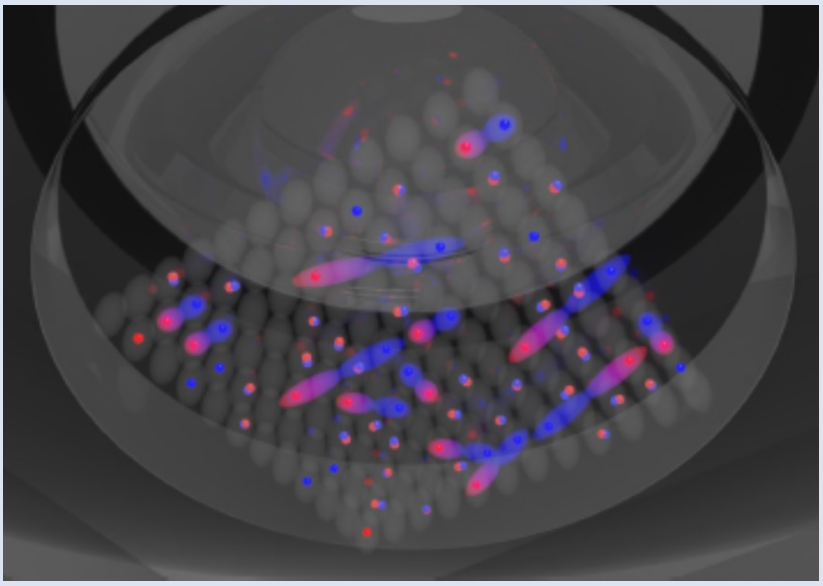

Abstract

Abstract: Recently atomic physics experiments have developed the tools and techniques to measure and manipulate quantum matter with exquisite precision. This advanced control resulted in a deeper understanding of fundamental quantum mechanics. Additionally, we gained insights to the behavior of several quantum systems which are theoretically and numerically difficult but are important beyond physics research, for example for fabricating better materials or devices. In this talk, I will give a brief introduction to atomic physics and then I will talk about our recent experiment when we observed long range pairing in the Fermi-Hubbard model. This was made possible by being able to see every atom constituting our system using our quantum gas microscope. I will also talk about how and why these pairs order themselves into a checkerboard pattern. Seeing the microscopic details of these systems can help us truly understand them which in turn can lead to utilitarian applications.