Abstract

When quantum fluids are placed into low-dimensional environments, they exhibit novel behaviors differing from that of a bulk quantum fluid. Helium-4 absorbed into mesoporous silica provides a physical example of such a low-dimensional system that is realizable in the laboratory. Analysis of these systems can provide valuable insight into the nature of quantum fluids, and may have applications to quantum interferometer devices. Using path integral Monte Carlo computation techniques I intend to simulate helium-4 absorbed into mesoporous silica to develop a better understanding of how it behaves when restricted to low dimensions.