

What does it take for a Hubbard model to be superconducting?
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In this talk I will examine what the minimal one-band 2D Hubbard model is that will exhibit d-wave superconductivity in the parameter range relevant for the cuprates. We use numerical methods that have methodologically very different limitations, DMRG and auxiliary field QMC, but are now in such good agreement that the results can be considered fully validated beyond these limitations. It turns out that the presence of a next-nearest neighbor hopping, as is present in the real-world cuprates, is indeed required. I will also discuss the relevance of boundary conditions and subtle finite-size effects which complicate the study of the model.