

March 29th, 2022 10:30 AM

MPSD seminar

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Title

“Twisted Transition Metal Dicalcogenides: Experimental Tests of Quantum Embedding Theories”

Abstract

The essential task of quantum many-body theory is to reduce the complexity of the quantum problem to the point at which the theory can be solved—but not beyond the point at which essential physics is lost. Comparison between controlled theory and controlled experiment is essential. This talk will introduce twisted transition metal dicalcogenides as an important experimental platform and quantum embedding theories (especially dynamical mean field theory) as crucial theoretical tool. The talk will present ideas and approximations involved in reducing this very complex system to a simple theoretical model—the Hubbard model, and survey the state of our knowledge of the properties of this model. It will then present specific Hubbard model calculations that appear to account for a considerable portion of the experimental observations, discuss the conceptual and practical limits of the calculations and outline open topics for future research

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