Quantum phase transitions in optical lattices

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Ultra-cold atoms in optical lattices are one of the most successful platforms for the study of quantum phases and their transitions. With the advent of quantum gas microscopy, those systems can now be studied and manipulated at the single atom and single site level, giving a new, microscopic perspective on the canonical quantum phases in strongly correlated systems. I will describe the tools and the capabilities of studying quantum phases with optical lattices, and review several groundbreaking experiments on quantum phase transitions in optical lattices.