

Many-body physics in arrays of ultracold atoms

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ABSTRACT:

Experimental setups such as trapped ions and ultracold neutral atoms in optical lattices provide us with a toolbox to implement a rich variety of models from condensed matter physics. In this talk I will present our theoretical proposal to use trapped ions to study quantum magnetism and models of interacting bosons, as well as a few experimental results on the implementation of this idea. I will also present some recent theoretical work on matter-wave superradiance of ultracold neutral atoms in optical lattices.