

Abstract Submitted
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Non-equilibrium dynamics in AMO quantum simulators ANDREW DALEY, University of Strathclyde — Recently, the possibility to control and measure AMO systems time-dependently has generated a lot of progress in exploring out-of-equilibrium dynamics for strongly interacting many-particle systems. This connects directly to fundamental questions relating to the relaxation of such systems to equilibrium, as well as the spreading of correlations and build-up of entanglement. While ultracold atoms allow for exceptional microscopic control over quantum gases with short-range interactions, experiments with polar molecules and chains of trapped ions now also offer the possibility to investigate spin models with long-range interactions. I will give an introduction to the recent developments in this area, illustrated with two examples: (i) the possibility to measurement entanglement for many itinerant particles with ultracold atoms in optical lattices, and (ii) new opportunities to compare dynamics with short and long-range interactions, especially using systems of trapped ions, where it is possible to control the effective range of interactions.

Andrew Daley
University of Strathclyde

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