

Abstract Submitted
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Towards Non-Equilibrium Dynamics with Trapped Ions¹ ARIEL SILBERT, SIERRA JUBIN, CHARLIE DORET, Williams College — Atomic systems are superbly suited to the study of non-equilibrium dynamics. These systems' exquisite isolation from environmental perturbations leads to long relaxation times that enable exploration of far-from-equilibrium phenomena. One example of particular relevance to experiments in trapped ion quantum information processing, metrology, and precision spectroscopy is the approach to thermal equilibrium of sympathetically cooled linear ion chains. Suitable manipulation of experimental parameters permits exploration of the quantum-to-classical crossover between ballistic transport and diffusive, Fourier's Law conduction, a topic of interest not only to the trapped ion community but also for the development of microelectronic devices and other nanoscale structures. We present progress towards trapping chains of multiple co-trapped calcium isotopes geared towards measuring thermal equilibration and discuss plans for future experiments in non-equilibrium statistical mechanics.

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