Many-body localization and thermalization in disordered Hubbard chains RUBEM MONDAINI, MARCOS RIGOL, The Pennsylvania State University — Recently, a lot of attention has been given to the aspects that lead isolated interacting quantum systems to thermalize. In the presence of disorder, however, the thermalization process fails resulting in a phenomena where transport is suppressed known as many-body localization. Unlike the standard Anderson localization for non-interacting systems, the delocalized (ergodic) phase is very robust against disorder even for moderate values of interaction. Another interesting aspect of the many-body localization phase is that under the time evolution of the quenched disorder, information present in the initial state may survive for arbitrarily long times. This was recently used as a probe of many-body localization of ultracold fermions in optical lattices with quasi-periodic disorder\textsuperscript{1}. Here, we will use numerical results in one-dimensional Hubbard chains to show that this analysis may suffer from substantial finite-size effects. We will also compare different types of disorder to see how the ergodicity is affected.\textsuperscript{2}

\textsuperscript{1}M. Schreiber \textit{et al.}, Science, \textbf{349} 842 (2015)