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### **Dynamical Response of Many-Body Localized Systems**

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Many-body localization (MBL) is the long sought-after generalization of Anderson localization to interacting systems. Many-body localized systems fail to thermalize, and display a variety of novel properties and phases that have no equilibrium analog. In this talk, I will review our rapidly evolving understanding of the MBL phase before describing the eigenstate properties and dynamical response of these phases in some detail. In particular, I will show how a slow local perturbation surprisingly induces a highly non-local charge response despite the localized nature of the phase. This effect lies beyond linear response theory and has implications for numerous fields, including topological quantum computation in quantum Hall systems and quantum control in disordered environments. I will also discuss the low-frequency Kubo conductivity of MBL systems, and discuss the crossover from the linear to the non-linear response regime with an emphasis on the time-scales and amplitudes of the drive.