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### **Interactions and dissipation in Floquet-Bloch systems<sup>1</sup>**

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Time periodic driving fields provide a versatile route for dynamically altering band structures. Particular excitement surrounds the possibility of controlling the topology of the resulting “Floquet bands,” whose topological classification is even richer than the one describing their static counterparts. While many schemes have been proposed for realizing interesting Floquet band structures, crucial questions remain regarding the many-body steady states of these systems. In this work we study the roles of interactions, heating, and dissipation in the population kinetics of many-particle Floquet systems. While a naive picture might lead one to expect rapid heating of any strongly driven interacting system, we find wide parameter regimes in which non-trivial Floquet steady states are obtained at intermediate and long times. Prospects for obtaining and probing the physics of these many-body Floquet systems will be discussed.

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