

DAMOP16-2016-020023

Abstract for an Invited Paper  
for the DAMOP16 Meeting of  
the American Physical Society

### **Engineering Floquet Hamiltonians in Cold Atom Systems<sup>1</sup>**

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In this talk I will first give a brief overview of the Floquet theory, describing periodically driven systems. Then I will introduce the concept of the high-frequency expansion and will show how it generalizes the celebrated Schrieffer-Wolff transformation to driven systems. Using these tools I will illustrate how one can engineer non-trivial interacting Hamiltonians mostly in the context of cold atom systems and discuss some experimental examples. In the end I will talk about issues of heating and adiabaticity and show that there are very strong parallels between Floquet systems and disordered systems. In particular, I will argue that the heating transition is closely analogous to the many-body localization transition.

<sup>1</sup>AFOSR, ARO, NSF