

Abstract Submitted  
for the MAS21 Meeting of  
The American Physical Society

**Floquet engineering of Kitaev quantum magnets** UMESH KUMAR, SAIKAT BANERJEE, SHI-ZENG LIN, Los Alamos National Laboratory — In recent years, there has been an intense search for materials realizing the Kitaev quantum spin liquid model. A number of edge-shared compounds with strong spin-orbit coupling, such as  $\text{RuCl}_3$  and iridates, have been proposed to realize this model. Nevertheless, an effective spin Hamiltonian derived from the microscopic model relevant to these compounds generally contains terms that are antagonistic toward the quantum spin liquid. This is consistent with the fact the zero magnetic field ground state of these materials is generally magnetically ordered. It is a pressing issue to identify protocols to drive the system to the limit of the Kitaev quantum spin model. In this work, we propose Floquet engineering of these Kitaev quantum magnets by coupling materials to a circularly polarized laser. We demonstrate that all the magnetic interactions can be tuned in situ by the amplitude and frequency of the laser, hence providing a route to stabilize the Kitaev quantum spin liquid phase.

Umesh Kumar  
Los Alamos National Laboratory

Date submitted: 14 Nov 2021

Electronic form version 1.4