

## Nonthermal interacting-magnon dynamics in an optically driven 2D Heisenberg antiferromagnet

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Recent theory results demonstrate a dynamical phase transition involving nonthermal magnon populations in the antiferromagnetic phase of the 2D Hubbard model upon laser driving [1]. These results were obtained in a one loop non-interacting magnon theory. Here we present first steps towards a full interacting theory of this dynamical phase transition using an interacting spin-wave theory with a large spin expansion and a Boltzmann formalism to investigate the effects of magnon-magnon interactions on the dynamical phase transition. The dynamical phase transition will be more completely characterized and implications for pump-probe experiments and ultrafast materials design of strongly correlated magnetism will be discussed.

*Acknowledgements:* DFG Emmy Noether program SE 2558/2-1, US Department of Energy, Office of Basic Energy Sciences, Division of Materials Sciences and Engineering Grant No. DE SC0012375, the Flatiron Institute is a Division of the Simons Foundation, the Max Planck-New York Center for Nonequilibrium Quantum Phenomena

### References

[1] Walldorf et al., Phys. Rev. B **100** 121110 (R) (2019).