Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**Control of Spin Wave Band Structure and Propagation in Two-Dimensional Magnonic Crystals**[1] GLADE SIETSEMA, MICHAEL E. FLATTÉ, Department of Physics and Astronomy, University of Iowa — We have studied the properties of spin waves in two-dimensional magnonic crystals consisting of a magnetic material arranged in a lattice of cylinders and embedded in a second magnetic material. Dispersion curves, linewidths, and spin wave propagation patterns were obtained from the Landau-Lifshitz-Gilbert equation using the plane wave expansion method[1]. We have examined how these results are affected by various parameters including the shape of the cylinders, the lattice structure, the material properties, and the spin-orbit interaction. Adjusting these values can open or close band gaps and drastically shift the frequency range of the band structure. The spin wave propagation patterns were found to exhibit high directionality dependent on the excitation frequency and can also be modified with the aforementioned parameters.

[1]arXiv:1111.2506

[1]This work was supported in part by DARPA/MESO and by C-SPIN, one of six centers of STARnet, a Semiconductor Research Corporation program, sponsored by MARCO and DARPA.

Glade Sietsema
Department of Physics and Astronomy, University of Iowa

Date submitted: 14 Nov 2014 Electronic form version 1.4