Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Gigantic Dzyaloshinskii-Moriya interaction in the MnBi ultrathin films JIE-XIANG YU, University of New Hampshire, JIADONG ZANG, Department of Physics and Materials Science Program, University of New Hampshire, ZANG'S TEAM — The magnetic skyrmion, a swirling-like spin texture with nontrivial topology, is driven by strong Dzyaloshinskii-Moriya (DM) interaction originated from the spin-orbit coupling in inversion symmetry breaking systems. Here, based on first-principles calculations, we predict a new material, MnBi ultrathin film, with gigantic DM interactions. The ratio of the DM interaction to the Heisenberg exchange is about 0.3, exceeding any values reported so far. Its high Curie temperature, high coercivity, and large perpendicular magnetoanisotropy make MnBi a good candidate for future spintronics studies. Topologically nontrivial spin textures are emergent in this system. We expect further experimental efforts will be devoted into this systems.

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Date submitted: 20 Nov 2016 Electronic form version 1.4