

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Emergent topological phenomena in thin films of pyrochlore iridates BOHM JUNG YANG, NAOTO NAGAOSA, RIKEN Center for Emergent Matter Science — With the recent development of thin film and artificial superstructure growth technique, it is possible to fabricate a system, smoothly connecting the two-dimensions (2D) and three-dimensions (3D). In this work we unveil the dimensional crossover of emergent topological phenomena. In particular, by focusing on the thin film of pyrochlore iridate antiferromagnets grown along the [111] direction, we demonstrate that it can show giant anomalous Hall conductance, which is as large as the Hall conductance of 3D quantum Hall insulators, even though there is no Hall effect in 3D bulk material. In addition, we show the emergence of a genuine new topological phase, dubbed the anti-Chern insulator, which is realized only in thin films. This shows that the thin film of topological materials is a new platform to search unexplored novel topological phenomena.

Bohm Jung Yang
RIKEN Center for Emergent Matter Science

Date submitted: 07 Nov 2013

Electronic form version 1.4