Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Observation of a topologically non-trivial surface state in half-Heusler PtLuSb (001) thin films JOHN LOGAN, SAHIL PATEL, SEAN HARRINGTON, Univ of California - Santa Barbara, CRAIG POLLEY, Max IV Laboratory, BRIAN SCHULTZ, Univ of California - Santa Barbara, T. BALASUBRAMANIAN, Max IV Laboratory, ANDERSON JANOTTI, University of Delaware, ANDERS MIKKELSEN, Lund University, CHRIS PALMSTRM, Univ of California - Santa Barbara — Topological insulators are a recently discovered new quantum state of matter that has a bulk band gap but also possesses cross-gap surface states which are protected by time-reversal symmetry. The experimental realization of topologically non-trivial surface states (TSSs) in materials such as Bi_2Se_3 has generated widespread interest in identifying other material systems that exhibit TSSs due to their many uses including spintronic devices. In particular, recent theory calculations suggest that TSSs may be found in certain half-Heusler ternary compounds. If experimentally realizable, this would provide an opportunity for the creation of entirely new heterostructure spintronic devices that make use of the structurally-identical but electronically-varied nature of Heusler compounds. Here, we show the presence of a TSS in the half-Heusler compound PtLuSb. Spin and angle-resolved photoemission spectroscopy reveals a surface state with linear dispersion and a helical tangential spin texture consistent with theoretical predictions and the expectation for a topological insulator.

John Logan
Univ of California - Santa Barbara

Date submitted: 05 Nov 2015 Electronic form version 1.4