Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Observation of unusual topological surface states in half-Heusler compounds LnPtBi (Ln=Lu, Y) Y.L. CHEN, Oxford University, Z.K. LIU, ShanghaiTech University, L.X. YANG, Tsinghua University, S.-C. WU, C. SHEKHAR, Max Planck Institute for Chemical Physics of Solids, Dresden, J. JIAN, ShanghaiTech University, H.F. YANG, SIMIT, Chinese Academy of Sciences, Y. ZHANG, S.-K. MO, Z. HUSSAIN, Advanced Light Source, Lawrence Berkeley National Laboratory,, B. YAN, C. FELSER, Max Planck Institute for Chemical Physics of Solids, Dresden — Topological quantum materials represent a new class of matter with both exotic physical phenomena and novel application potentials. Many Heusler compounds, which exhibit rich emergent properties such as unusual magnetism, superconductivity and heavy fermion behaviour, have been predicted to host non-trivial topological electronic structures. The coexistence of topological order and other unusual properties makes Heusler materials ideal platform to search for new topological quantum phases (such as quantum anomalous Hall insulator and topological superconductor). By carrying out angle-resolved photoemission spectroscopy and ab initio calculations on rare-earth half-Heusler compounds LnPtBi (Ln=Lu, Y), we directly observe the unusual topological surface states on these materials, establishing them as first members with non-trivial topological electronic structure in this class of materials. Moreover, as LnPtBi compounds are non-centrosymmetric superconductors, our discovery further highlights them as promising candidates of topological superconductors.

Yulin Chen
Oxford University

Date submitted: 11 Nov 2016 Electronic form version 1.4