Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Superconductivity induced by In substitution into the topological crystalline insulator $Pb_{0.5}Sn_{0.5}Te$ RUIDAN ZHONG, JOHN SCHNEELOCH, TIANSHENG LIU, Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory, NY 11973, USA, FERNANDO CAMINO, Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY 11973, USA, JOHN TRANQUADA, GENDA GU, Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory, NY 11973, USA — Indium substitution turns the topological crystalline insulator (TCI) $Pb_{0.5}Sn_{0.5}Te$ into a possible topological superconductor. To investigate the effect of the indium concentration on the crystal structure and superconducting properties of $(Pb_{0.5}Sn_{0.5})_{1-x}In_xTe$, we have grown high-quality single crystals using a modified floating-zone method and have performed systematic studies for indium content in the range $0 \leq x \leq 0.35$. We find that the single crystals retain the rocksalt structure up to the solubility limit of indium ($x \sim 0.30$). Experimental dependencies of the superconducting transition temperature (T_c) and the upper critical magnetic field (H_{c2}) on the indium content x have been measured. The maximum T_c is determined to be 4.7 K at $x = 0.30$, with $\mu_0 H_{c2}(T = 0) \approx 5T$.

Ruidan Zhong
Condensed Matter Physics and Materials Science Department,
Brookhaven National Laboratory, NY 11973, USA

Date submitted: 13 Nov 2014 Electronic form version 1.4