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MBE growth and transport of the topologically tunable (Bi_{1-x} In $_x)_2Se_3$ system MATTHEW BRAHLEK, NAMRATA BANSAL, NIKESH KOIRALA, Rutgers University Physics and Astronomy, SUYANG XU, ZAHID HASAN, Princeton University Physics, SEONGSHIK OH, Rutgers University Physics and Astronomy — A current challenge in the field of topological insulators (TI) is identifying a clear transport signal of the surface conduction. The structural similarity between Bi_2Se_3 and In_2Se_3 allowed us to combine the two to obtain (Bi_{1-x} In $_x)_2Se_3$; Bi_2Se_3 has inverted bands, and thus is a non-trivial insulator. In_2Se_3 has no inverted bands and is therefore a trivial band insulator with energy gap 1.3-1.9eV. The mixing ratio x can be thought of as a knob to switch the system from a trivial to a non-trivial state. I will briefly discuss our scheme for producing atomically smooth molecular beam epitaxial grown thin films. I will also discuss our work on transport in the TI-to-non TI regime, and the metal to insulator regime, and compare these results with angle resolved photo emission spectroscopy data.

[X] Prefer Oral Session
[ ] Prefer Poster Session

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