

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Solution processable routes to nanostructured thermoelectric materials** JOSEPH FESER, Department of Mechanical Engineering, University of California - Berkeley, ROBERT WANG, The Molecular Foundry, Lawrence Berkeley National Laboratory, ARUN MAJUMDAR, Department of Mechanical Engineering, University of California - Berkeley, JEFFREY URBAN, The Molecular Foundry, Lawrence Berkeley National Laboratory — The previous decade of research has shown that nanostructured thermoelectric materials can have superior performance compared to their bulk counterparts.. Often, the synthesis of nanostructured materials is performed by layer-by-layer methods, which hinders their ability to be produced as thick films. Here we show a scheme by which nanocrystals embedded in a thermoelectric matrix may be produced using solution processing. Using hydrazine chemistry, we prepare soluble precursors for  $\text{Bi}_2\text{X}_3$  ( $\text{X}=\text{S},\text{Se},\text{Te}$ ). Solutions containing those precursors are spun and drop-cast onto substrates, and their electrical and thermal properties are characterized. We show ongoing research to embed colloidal nanocrystals into a matrix made from the soluble precursors.

Joseph Feser  
Department of Mechanical Engineering, University of California - Berkeley

Date submitted: 21 Nov 2008

Electronic form version 1.4