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Abstract for an Invited Paper
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Synthesis & Properties of Nano-Composite Thermoelectric Materials¹

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PbTe nanocrystals have been grown in our labs by chemical vapor deposition. These materials grow in size selective regions exhibiting very high yield and have size distributions of around 100 nm to 1000 nm. These nano-materials are incorporated into a bulk matrix, making a composite material in hopes of achieving a higher thermoelectric performance due to the increased phonon scattering that the nano-materials are expected to exhibit, as well as potential for enhancement of their Seebeck coefficient. Some of the advantages as well as the challenges will be discussed. These nanocomposites give a new level of potential control as a tuning parameter with which to vary the materials' thermoelectric properties. In addition, Bi₂Te₃, another state of the art thermoelectric material and skutterudites (CoSb₃) have been synthesized as nanomaterials using hydrothermal techniques. A brief discussion of the synthesis techniques, the characterization techniques and highlights of several systems of materials will be presented.

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