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Copper Selenide Nanocrystals as a High Performance, Solution Processed Thermoelectric Material JASON FORSTER, Lawrence Berkeley National Lab, JARED LYNCH, Nanosys, NELSON COATES, California Maritime Academy, AYASKANTA SAHU, Lawrence Berkeley National Lab, JUN LIU, North Carolina State University, DAVID CAHILL, University of Illinois at Urbana Champaign, JEFF URBAN, Lawrence Berkeley National Lab — Nano-structuring a thermoelectric material often results in enhanced performance due to a decrease in the materials thermal conductivity. Traditional nano-structuring techniques involve ball milling a bulk material followed by spark plasma sintering, a very energy intensive process. In this talk, we will describe the development of a self-assembled, high-performing, nano-structured thin film based on copper selenide nanocrystals. Mild thermal annealing of these films results in concurrent increases in the Seebeck coefficient and electrical conductivity. We are able to achieve power factors at room temperature that are as high as the best spark plasma sintered materials. These solution-processed films have potential applications as conformal, flexible materials for thermoelectric power generation.

Jason Forster
Lawrence Berkeley National Lab

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