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Thermoelectric Properties in Nanostructured p-type Skutterudites XIAO YAN, Boston College, QING HAO, Massachusetts Institute of Technology, JIAN YANG, HUI WANG, YUCHENG LAN, DEZHI WANG, Boston College, GANG CHEN, Massachusetts Institute of Technology, ZHIFENG REN, Boston College, BOSTON COLLEGE COLLABORATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY COLLABORATION — Skutterudites are good examples of phonon glass electron crystal (PGEC), which is proposed to be one of the most desirable materials to maximize the thermoelectric figure of merit. The skutterudite structure has two voids in each unit cell that are large enough to accommodate a variety of atoms, such as La, Ce, Nd, Sm, Yb, etc. These atomic void-fillers rattle about in their oversized cages, thereby drastically reducing thermal conductivity and maximizing ZT. My work on p-type skutterudites is based on compounds of a general formula $RFe_{3.5}Co_{0.5}Sb_{12}$ where R stands for a void filler. Besides the influence of rattling of the void fillers, thermal conductivity can be further depressed by the increased phonon scattering at the increased grain boundaries due to nano size grains.

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