tions in the filled skutterudites are due mostly to the fraction of the rare-earth sites that remain empty in samples prepared using equilibrium-synthesis methods. A simple semiconductor-transport model successfully reproduces most of the qualitative features of the resistivity and Seebeck data from these materials. By varying the extrinsic carrier concentration in the filled skutterudites, this model yields a maximum value for *ZT* of 1.4 at 1000 K and a maximum *ZT* value of 0.3 at 300 K.

The filled-skutterudite antimonides have demonstrated the validity of the "electron-crystal, phonon-glass" idea in the design of new thermoelectric materials for operation at elevated temperatures. There are many other crystal structures and compounds that contain atomic cages large enough to incorporate additional atoms. It is believed that the filled-skutterudite antimonides only represent a small fraction of a more general class of "rattling semiconductors" and that some of these materials will undoubtedly have high values for *ZT* at and below room temperature.

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***Brian C. Sales** is a co-group leader of the Novel Materials Group in the Solid State Division at the Oak Ridge National Laboratory. He received a PhD degree from the University of California—San Diego. His research concerns the synthesis and characterization of unusual electronic, magnetic, and optical materials. His current interests include novel phosphate glasses, high-temperature superconductors, extended electron compounds, quantum magnetism in low-dimensional systems, and the development of thermoelectric materials with improved efficiencies. Sales can be reached at the following e-mail address: vb4@ornl.gov.*