UW Chemical Engineering

Fall 2013 Seminar Series

Date: Monday, December 2
Time: 4:00 - 5:00 p.m.
Place: PAA A114
Topic: *Advanced Nanostructured Thermoelectric Materials for Waste Heat Recovery*

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Biography

Professor Wu received his PhD from Harvard University in Chemistry in 2006. He performed postdoctoral research until 2009 at the University of California, Berkeley where he received the Miller Research Fellowship. Since joining the School of Chemical Engineering at Purdue University in 2009, his research has been focused on the investigation of broadly-defined nanostructured materials and their potential applications for energy conversion and storage, including photovoltaic solar cells, thermoelectrics, and batteries. Prof. Wu has extensive experience in nanomaterials synthesis, assembly, characterization, and device fabrication. Since 2000, he has published 40 peer-reviewed articles in nanotechnology and renewable energy research with a personal H-index of 20 and the publications have been cited ~4300 times. His group has developed the chemical synthetic methods to mass produce chalcogenide nanostructures and investigated their potential in thermoelectric applications. His research has been featured in Chemical and Engineering News, MRS Bulletin, Nature magazine, Materials Today magazine, Technology Review, National Public Radio (NPR), National Science Foundation (NSF), etc.

Abstract

The rapid development of thermoelectric materials in the past decade has provided a possibility of directly converting waste heat back to electricity based on the Seebeck effect. In the past three years, we have developed a transformative approach to pioneered low cost and scalable solution-phase growth methods to mass produce thermoelectric nanowires and nanowire heterostructures to match the physical and economic magnitudes of energy use and economical entertainment in the manufacture/recycling. These nanostructured thermoelectric materials show a significantly enhanced performance compared to the bulk crystals based on the quantum confinement and energy filtering.