



Weekly Seminar

Neutron Scattering Study of the Temperature-Dependent Phonon Spectra of AgSbTe_2

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Oak Ridge National Laboratory

Time: 4:00pm, Dec.12, 2012 (Wednesday)

时间: 2012年12月12日 (周三) 下午4:00

Venue: Room 607, Conference Room A, Science Building 5

地点: 理科五号楼607会议室

Abstract

The thermoelectric material AgSbTe_2 has attracted much attention due to the simple rocksalt structure, the high thermoelectric figure-of-merit, and the low thermal conductivity. Using the neutron scattering technique, we survey the phonon spectra across the entire Brillouin zone, and reveal a spontaneously-forming nanostructure in crystalline AgSbTe_2 , which leads to a suppression of thermal conductivity to a glass-like level. In particular, our phonon measurement provide a quantitative account of the bulk thermal conductivity, and also present the microscopic anisotropies associated with nanostructure, which are not accessible to bulk probes. The anomalously low thermal conductivity of AgSbTe_2 is shown to arise from the formation of short-range ordered nanodomains on the Ag/Sb cation sublattice, and additional stacking faults. The spontaneous formation of the nanostructure alleviates the need to artificially introduce nanostructural features in this material. These results point to avenues for designing new low-thermal conductivity materials for efficient thermoelectric and phase-change applications.

About the Speaker

马杰, 2003年中国科大材料物理学学士学位, 2010年美国爱荷华州立大学物理博士学位, 2010年-今美国橡树岭国家实验室博士后研究员。