
TCSUH Special Seminar

**Intrinsic Low Thermal Conductivity
and Enhanced Thermoelectric
Performance in Low Dimensional
Structured Materials**

Wednesday, October 5, 2016
HSC 102: 12:00PM – 1:00PM



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ABSTRACT:

Reducing the material's dimensionality plays a vital role in revealing novel phenomena in condensed matter physics. A large number of unusual properties have been discovered in low-dimensional solids, such as the metal-insulator transitions, charge density waves, superconductivity and complex magnetic phenomena. For thermoelectricity, attempts to use lower dimensional structures to enhance their energy conversion performance have engaged many research groups throughout the world for the past 20 years due to its intrinsic ultra-low thermal conductivity, a feature that is highly desirable for a good thermoelectric material. In this talk, the thermoelectric properties of quasi-one-dimensional SbCrSe_3 based compound and Quasi-two-dimensional based $\text{Cr}_2\text{Ge}_2\text{Te}_6$ compound will be discussed. Mechanisms leading to low thermal conductivity and enhanced electrical conductivity are also discussed in terms of the Debye-Callaway model and band structure calculations

BIO:

Dr. Zhou is currently the chair of the Analytical and Test Center of Chongqing University and a professor at the department of Applied Physics. She gained her Ph.D. in Applied Physics from the Hong Kong Polytechnic University in 2008. After her Ph.D, she joined the University of Washington as a Postdoctoral Fellow under the supervision of Professor Guozhong Cao, where she worked on nanostructured material for energy conversion and storage application as dye sensitized solar cell and lithium ion battery. In 2010, she moved to University of Michigan as a Postdoctoral Fellow under the supervision of Professor Ctirad Uher. Her research has been concentrating on manufacturing high-performance smart functional materials for thermoelectric application, and on understanding their underlying physics and chemistry for better designing the manufacturing. As a Chief Investigator, Dr. Zhou has succeeded in winning many competitive research grants including 4 NSFC grants, and 2 CQU grants. Dr. Zhou has contributed more than 80 original journal publications, 5 patents and over 20 invited talks or oral presentations.

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