**High-Performance Thermoelectric Materials: Progress and Applications**

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To reduce our dependence on fuel oil and green gas emission, the search for the high figure of merit (ZT) thermoelectric materials have been carried out extensively to convert waste heat into useful electricity. Metal chalcogenides (such as GeTe, SnSe, Cu2Se, and Bi2Te3), as ideal thermoelectric candidates for room temperature and intermediate temperature applications, have been considered the most important thermoelectric materials in this field and show great potential on thermoelectrics. However, further improve their thermoelectric performance have been a current global research focus, which needs innovative strategies. In this presentation, through employing bandgap engineering and nanostructural engineering, we summaries our recent findings on a range of metal chalcogenides with improved thermoelectric properties and their applications in energy conversion generators and medical devices.

Prof. Zhi-Gang Chen is currently a Professor in Energy Materials at the University of Southern Queensland. He received his PhD in the Institute of Metal Research, Chinese Academy of Science, in 2008. After his PhD, he moved to the University of Queensland with various prestigious fellowships, including UQ Postdoctoral Fellowship, ARC Postdoctoral Fellowship, and QLD Smart Future Fellowship. In 2012, he won a Queensland International Fellowship to undertake a collaborative research at California Institute of Technology. His research concentrates in smart materials for thermoelectrics from synthesizing materials to understanding their underlying physics and chemistry.

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