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ACCMS-Global Research Center, SRMIST, Chennai India

Webinar #8

Prof. Thang Bach Phan

Center for Innovative Materials and Architectures, Vietnam National University Ho Chi Minh, Vietnam

Title: Experimental research on Thermoelectric based oxide thin films: Open questions to Computational Materials Sciences

26th April 2022, 10.00 – 11.30 am IST

Registration link: https://tinyurl.com/34y9mhyw

Biography

Prof. Thang Bach Phan received his Ph.D. in School of Advanced Materials and Engineering, Sungkyunkwan University, South Korea in 2009. He is the Director of Center for Innovatives Materials and Architectures (INOMAR), Vietnam National University Ho Chi Minh City (VNU-HCM). His research interests are synthesis and applications of nano structural materials for thermoelectric conversion, drug delivery, biosensors and gas sensors. He have been holding a Principal investigator (PI) of more than 10 key projects funded from Ministry of Science and Technology (MOST), National Foundation for Science and Technology Development (NAFOSTED), VNU-HCM. He is also a Standing committee (2019-2024) of Vietnam Materials Research Society (V-MRS), Scientific committees member of NAFOSTED – Physics division (2017 - present), Standing committee and Vice President (2017-2022) of Vietnam Magnetic Society, Council members (2017 - present) of The Asian Union of Magnetics Societies (AUMS). To his credit, he has published about 100 papers in reputed peer-reviewed International Journals.

Abstract

Since the discovery of the thermoelectric effect—conversion of heat into electricity based on the Seebeck effect—two hundred years ago, thermoelectricity has been remarkably developed to partially deal with the recent energy crisis around the world. Thermoelectric materials coverts the heat exhausted from vehicles, chemical/steel/coal plants, and even from the human body to generate electricity following the equation of the dimensionless figure-of-merit, $ZT = S^2\sigma T/(\kappa_l + \kappa_e)$, where S represents Seebeck coefficient, σ denotes electrical conductivity, T is the absolute temperature, κ_l, and κ_e represent the lattice and electron thermal conductivity, respectively. The low efficiency is the main drawback hindering the widespread practical usage of thermoelectric devices. Several methods, such as band engineering (resonant state doping, band convergence, or quantum confinement), have been proposed to improve the efficiency, the power factor (PF = $S^2\sigma$), and structural engineering (grain refinement, introducing precipitates, and porosity design), and to reduce thermal conductivity (κ_l, and κ_e). In this talk, I will report our experimental thermoelectric results for bulk as well as thin films of ZnO and $CuCrO_2$ materials. Some challenges will be pointed out as the open questions to Computational research.

Zoom meeting details will be shared with the registered participants

Convener:

Prof. Yoshiyuki Kawazoe
Head, ACCMS-GRC
SRMIST, KTR

Organizers:

Dr. V.J.Surya and Dr.S. Yuvaraj
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