I²CNER Seminar Series

International Institute for Carbon-Neutral Energy Research (WPI-I²CNER)
Kyushu University

Title # Tuning Thermal Transport and Magnetization Dynamics in Functional Materials

Speaker ***Professor Xiaojia Wang***
College of Science and Engineering,
University of Minnesota, Twin Cities, U.S.A.

Time& Date 1:30 PM (JST), Tuesday, June 30th, 2026

Venue Hybrid format (I²CNER Hall C, I²CNER Bldg. 1, Ito Campus, Zoom)

Abstract

Transport phenomena play an essential role in designing and engineering materials with tailored functionalities. In this talk, I will highlight our group's efforts in integrating ultrafast spectroscopy and material engineering to uncover the fundamental mechanisms and new phenomena that govern thermal transport and magnetization dynamics in functional materials. I will share examples, including how we understand and further control thermal transport in (ultra)wide-bandgap perovskite oxides for power electronics, and how we tailor magnetization dynamics (e.g., damping and magnetic anisotropy) in perpendicular $L1_0$-FePd and synthetic antiferromagnets for energy-efficient spintronic applications. If time permits, I will also discuss our discovery of spin-strain coupling in perpendicular Co/Pd multilayers, which provides new pathways for dynamic magnetization control via high-frequency acoustic strains. By combining ultrafast dynamics with materials design, we aim to establish a microscopic understanding of transport and relaxation processes that can ultimately guide the rational design of materials for energy, information, and quantum technologies.

About the Speaker

Dr. Xiaojia Wang is a professor in the Department of Mechanical Engineering at the University of Minnesota, Twin Cities (UMN). Before joining the UMN in 2014, she was a postdoctoral research associate in the Department of Materials Science and Engineering at the University of Illinois at Urbana-Champaign. She received her Ph.D. in Mechanical Engineering from the Georgia Institute of Technology in 2011, and her M.S. (2007) and B.S. (2004) in Mechanical Engineering from Xi'an Jiaotong University, China. Her group focuses on utilizing ultrafast optical metrology to explore energy transport and dynamic processes for applications in electronic cooling, solid-state energy conversion, spintronics, and magnetic recording. For details, please visit her research group website: https://mnttl.umn.edu/publications.

Registration https://forms.cloud.microsoft/r/iBspdN5WNR

Host Prof. Masamichi Kohno

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