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Thermal Phonon Transport for Energy Applications and Beyond

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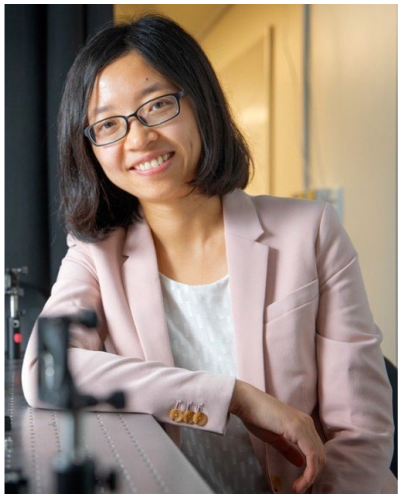
Date: Friday, January 13, 2023 14:00-15:00
Venue: Faculty of Engineering Bldg. 2, Room 233／Online (hybrid)

Abstract:

The ever-increasing energy demand and greenhouse gas emissions call for a clean energy economy. With my group's expertise in thermal transport and energy conversion, our efforts to contribute to a sustainable energy future come twofold: 1) Developing renewable energy harvesting technologies from thermal energy; 2) Designing energy-efficient cooling technologies to save energy. Thermal phonons (THz lattice vibrations) are the major heat carriers in insulators and semiconductors. A solid grasp of thermal phonon transport is essential to designing materials and devices for thermal energy conversion and management. In this talk, I will share my group's work on thermal phonon transport using atomistic modeling and optical measurements. More specifically, I will share our inelastic x-ray scattering measurements to probe phonon dynamics of ultrahigh and ultralow thermal conductivity materials, our development of anharmonic atomistic Green's function method for interfacial thermal modeling, our discovery of thermal diode behaviors in asymmetric polymer macromolecules using molecular dynamics simulations, and our very recent work on accurately predicting the thermal conductivity of high-temperature phase from four-phonon scattering and unified theory using machine-learned temperature-dependent potentials. Finally, I will share a few snapshots about the new directions my group is heading by leveraging our core phonon expertise, spanning quantum computing, neuromodulation, and space exploration.



Registration(Venue/Online)
https://forms.gle/BSjaabcEF1PL9dFY9
Please register by Jan.12.

主催：
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