

Nanophotonic and Optoelectronic Control of thermal Radiation for Heat Transfer and Energy Conversion



Prof. Bo Zhao

Kalsi Assistant Professor

Department of Mechanical Engineering

University of Houston

Friday, October 1, 10:00 am US central time

Room: Zoom*

<https://uofh.zoom.us/j/845619943?pwd=QIZvYUV6M2dxNDkvNWxBd3F2YzdJZz09>

Meeting ID: 845 619 943

Passcode: 016104

LECTURE ABSTRACT

Radiative energy transport process plays a fundamental role in advanced heat transfer and energy conversion systems. Conventionally, the performance of these systems is subject to the fact that thermal radiation is broadband, and its intensity must be lower than the blackbody limit. In this talk, I will discuss how nanophotonics and optoelectronics enable us to overcome these constraints and control thermal radiation effectively. I will show how to manipulate thermal plasmon and phonon polaritons in nanostructures and 2D materials to control the spectrum of thermal radiation, and how to utilize near-field techniques and optoelectronic approaches to respectively control the density of state and the chemical potential of photons for super-Planckian thermal radiation. I will talk about the applications that can be enabled by controlling photon transport in heat transfer, energy conversion, and power electronics.

SPEAKER BIOSKETCH

Bo Zhao received his Ph.D. in Mechanical Engineering from Georgia Institute of Technology in 2016. He was a postdoctoral research associate at Stanford University in Electrical Engineering before joined University of Houston as an assistant professor in 2021. His research interests are photonics and their applications in advanced thermal and energy systems. He received the best poster award in 2013 ASME International Mechanical Engineering Congress & Exposition. Several of his work have been recognized by web of science as “highly cited” or selected as journal covers.

SPONSORED BY

UNIVERSITY of **HOUSTON**

TEXAS CENTER FOR SUPERCONDUCTIVITY

UNIVERSITY of **HOUSTON**
CULLEN COLLEGE of ENGINEERING