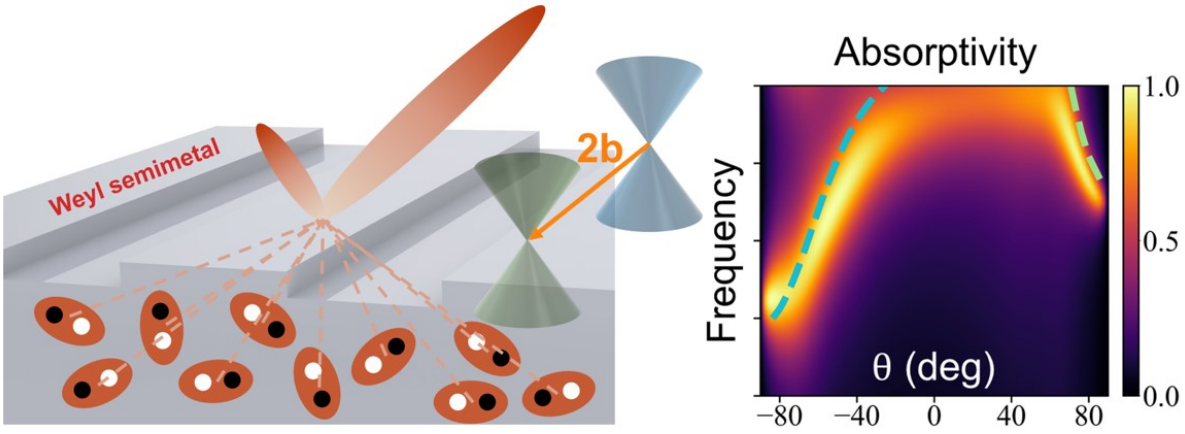
Zhao Group
Thermal Photonics & Beyond

UNIVERSITY of HOUSTON

Thermal PhotoniX (TPX) Lab (https://energyzhao.github.io/) in the Department of Mechanical Engineering at the University of Houston have immediate openings for fully funded Ph.D. Highly motivated students with a strong background in Physics, Material Science, Optics, Thermal Science, or Photonics are encouraged to apply. Please email your CV, transcripts, and your representative work (if any) directly to Dr. Zhao (bzhao8@uh.edu).



Research in Thermal PhotoniX (TPX) Lab are broadly thermal radiation, nanophotonics, energy conversion, electronics, plasmonics, 2D materials, and numerical design. Our lab's work has been published in leading journals in the field, including ***Nature Photonics***, ***Science Advances, Nature Communications, PNAS, Nano Letters, Physical Review X, Advanced Optical Materials,*** and ***International Journal of Heat and Mass Transfer***. In the past, we discovered the nonreciprocal thermal radiation in topological materials, invented the first electronic circuit for high-performance thermophotonic system, and experimentally measured record-breaking near-field effect for thermal management and energy harvesting applications.

Current research directions include but not limited to

- Thermal photonics and plasmonics
- Photon-mediated heat engines and refrigerators
- Electronic, photonic, and thermal circuits
- Radiative properties: tuability, symmetry, nonreciprocity, topology, and beyond
- Enhanced radiative heat transfer
- Photon chemical potential and light emission from nonequilibrium bodies
- Solar energy harvesting and radiative cooling
- Electromagnetic theory
- Quantum effects in photon transport processes

We welcome you to join us to shape the future!