

# Xin WU

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## Education

- 2023.12 **Ph.D.**, Solid Mechanics, South China University of Technology, China
- 2018.07 **B.E.**, Engineering Mechanics, Chang'an University, China

## Employment

- 2024.04– Present **The University of Tokyo**, *JSPS Foreign Special Research Fellow*  
(Worked with Prof. Masahiro Nomura)
- 2022.11– 2023.10 **The University of Tokyo**, *Visiting Associate Research Fellow*  
(Supervisors: Prof. Masahiro Nomura & Prof. Qiang Han)

## Research Interests

**Keywords:** 2D Materials and heterostructures; Thermal transport; MLP-based MD

I primarily centers on advancing the understanding and control of thermal transport in two-dimensional (2D) materials and their heterostructures. My expertise lies in developing and applying machine-learned potential (MLP)-based molecular dynamics (MD) simulations to explore and optimize the thermal transport properties. This research aims to unlock new possibilities for thermal management in electronic and energy devices by designing materials with tailored thermal behaviors.

## Publications (Past 5 years)

- [1] **Xin Wu\***, Yunhui Wu, Xin Huang, Zheyong Fan, Sebastian Volz, Qiang Han\*, Masahiro Nomura\*, Isotope interface engineering for thermal transport suppression in cryogenic graphene, **Materials Today Physics**, 2024, 46, 101500.
- [2] **Xin Wu\***, Xin Huang, Lei Yang, Zhongwei Zhang, Yangyu Guo, Sebastian Volz, Qiang Han\*, Masahiro Nomura\*, Suppressed thermal transport in mathematically inspired 2D heterosystems, **Carbon**, 2023, 213, 118264.
- [3] **Xin Wu**, Penghua Ying, Chunlei Li\*, Qiang Han\*, Dual effects of hetero-interfaces on phonon thermal transport across graphene/C3N lateral superlattices, **International Journal of Heat and Mass Transfer**, 2023, 201, 123643.
- [4] **Xin Wu**, Qiang Han\*, Tunable anisotropic in-plane thermal transport of multi-layer graphene induced by 2D empty space: insights from interfaces **Surfaces and Interfaces**, 2022, 33, 102296.

- [5] **Xin Wu**, Qiang Han\*, Maximum thermal conductivity of multilayer graphene with periodic two-dimensional empty space, [International Journal of Heat and Mass Transfer](#), 2022, 191, 122829.
- [6] **Xin Wu**, Qiang Han\*, Transition from incoherent to coherent phonon thermal transport across graphene/h-BN van der Waals superlattices, [International Journal of Heat and Mass Transfer](#), 2022, 184, 122390.
- [7] **Xin Wu**, Qiang Han\*, Phonon Thermal Transport across Multilayer Graphene/Hexagonal Boron Nitride van der Waals Heterostructures, [ACS Applied Materials & Interfaces](#), 2021, 13, 32564-32578.
- [8] **Xin Wu**, Qiang Han\*, Thermal transport in pristine and defective two-dimensional polyaniline (C<sub>3</sub>N), [International Journal of Heat and Mass Transfer](#), 2021, 173, 121235.
- [9] **Xin Wu**, Qiang Han\*, Semidefective Graphene/h-BN In-Plane Heterostructures: Enhancing Interface Thermal Conductance by Topological Defects, [Journal of Physical Chemistry C](#), 2021, 125, 2748-2760.
- [10] **Xin Wu**, Qiang Han\*, Thermal conductivity of monolayer hexagonal boron nitride: From defective to amorphous, [Computational Materials Science](#), 2020, 184, 109938.
- [11] **Xin Wu**, Qiang Han\*, Thermal conductivity of defective graphene: an efficient molecular dynamics study based on graphics processing units, [Nanotechnology](#), 2020, 31, 215708.
- [12] **Xin Wu**, Qiang Han\*, Directional Gradientless Thermoexcited Rotating System Based on Carbon Nanotubes and Graphene, [Journal of Nanomaterials](#), 2019, No. 8263843.
- [13] Haikuan Dong\*, Yongbo Shi, Penghua Ying, Ke Xu, Ting Liang, Yanzhou Wang, Zezhu Zeng, **Xin Wu**, Wenjiang Zhou, Shiyun Xiong, Shunda Chen\*, Zheyong Fan\*, Molecular dynamics simulations of heat transport using machine-learned potentials: A mini-review and tutorial on GPUMD with neuroevolution potentials, [Journal of Applied Physics](#), 2024, 135, 161101.
- [14] Tianchong Wu, Xu Jiang, **Xin Wu**, Qiang Han\*, Acoustic topological valley transport with multimode edge states, [Journal of Applied Physics](#), 2021, 130, 124401.
- [15] Chunlei Li, Qiang Han\*, Zhan Wang, **Xin Wu**, Analysis of wave propagation in functionally graded piezoelectric composite plates reinforced with graphene platelets, [Applied Mathematical Modelling](#), 2020, 81, 487-505.