Chenmu Zhang

6100 Main St, Houston, TX 77005 Mobile: (+1) 737-228-8750 Email: Chenmu.Zhang@rice.edu

EDUCATION

University of Texas at Austin
Ph.D. in Materials Engineering
Advisor: Prof. Yuanyue Liu
Thesis: "Phonon-limited Carrier Transport in 2D Materials from First Principles"

University of Science and Technology of China (USTC) B.S. in Physics Advisor: Prof. Wenguang Zhu Thesis: "First Principles Calculations on 2D Ferroelectric Materials under Uniaxial Strain"

WORK EXPERIENCES

Postdoctoral Research Associate

Advisor: Prof. Boris I. Yakobson, Rice University, Houston, TX, United States Developed and utilized first-principles calculations to study the dynamic process of defect in transition metal dichalcogenide monolayers

Graduate Research Assistant

Advisor: Prof. Yuanyue Liu, University of Texas at Austin, Austin, TX, United States Improved and developed first-principles algorithms for phonon-limited mobility of 2D semiconductors Developed Monte Carlo code for high-field electron transport in 2D semiconductors Studied on other electron-phonon scattering factors in 2D materials including remote phonon and substrate effect

PUBLICATIONS

- 1. **Zhang, C.**; Liu, Y. <u>Realistic Fröhlich Scattering and Mobility of 2D Semiconductors in van der Waals</u> <u>Heterostructure</u>. arXiv preprint arXiv:2404.08114 **2024**.
- 2. Zhang, C.; Liu, Y. <u>Two-dimensional Semiconductor Computational Carrier Mobility Genome</u>. arXiv preprint arXiv:2404.08117 2024.
- 3. Zhang, C.; Liu, Y. Electron-surface scattering from first-principles. ACS Nano 2024, 18 (40), 27433
- 4. **Zhang, C.**; Xiao, Z.; Paddock, R.; Cullinan, M.; Tehrani, M.; Liu, Y. <u>Effects of Graphene Doping on the Electrical Conductivity of Copper</u>. Advanced Functional Materials **2024**.
- 5. Zhang, C.; Wang, R.; Mishra, H.; Liu, Y. <u>Two-dimensional Semiconductors with High Intrinsic Carrier</u> <u>Mobility at Room Temperature</u>. Phys. Rev. Lett. **2023**, 130 (8), 087001.

Aug. 2018 - Apr. 2023

Sept. 2014 – Jul. 2018

May 2023 – Current

Aug. 2018 – Apr. 2023

- 6. **Zhang, C.**; Liu, Y. <u>Phonon-limited transport of two-dimensional semiconductors: Quadrupole scattering and free carrier screening</u>. Phys. Rev. B **2022**, 106 (11).
- Zhang, C.; Cheng, L.; Liu, Y. <u>Understanding high-field electron transport properties and strain effects of</u> monolayer transition metal dichalcogenides. Phys. Rev. B 2020, 102 (11), 115405.
- 8. **Zhang, C.**; Cheng, L.; Liu, Y. <u>Role of flexural phonons in carrier mobility of two-dimensional semiconductors:</u> <u>free standing vs on substrate.</u> J. Phys.: Condens. Matter **2021**, 33 (23), 234003.
- 9. Xiao, Z.; Guo, R.; Zhang, C.; Liu, Y. Point Defect Limited Carrier Mobility in 2D Transition Metal Dichalcogenides. ACS Nano 2024, 18 (11), 8511.
- Cheng, L.; Zhang, C.; Liu, Y. Intrinsic charge carrier mobility of 2D semiconductors. Computational Materials Science 2021, 194, 110468.
- Cheng, L.; Zhang, C.; Liu, Y. <u>Why Two-Dimensional Semiconductors Generally Have Low Electron Mobility</u>. Phys. Rev. Lett. 2020, 125 (17), 177701.
- 12. Cheng, L.; Zhang, C.; Liu, Y. <u>The Optimal Electronic Structure for High-Mobility 2D Semiconductors:</u> <u>Exceptionally High Hole Mobility in 2D Antimony</u>. J. Am. Chem. Soc. **2019**, 141 (41), 16296-16302.
- Cheng, L.; Zhang, C.; Liu, Y. <u>How to resolve a phonon-associated property into contributions of basic phonon</u> <u>modes</u>. J. Phys. Mater. 2019, 2 (4), 045005.

TEACHING

- > Teaching assistant in Structure of Materials, fall, 2022
- > Teaching assistant in Structure of Materials, fall, 2021