Shixian Liu

Ph.D. Candidate

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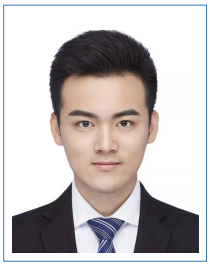
Github



Work history

From 2025 **Assistant**, *Bauman Moscow State Technical University*, Moscow, Russia.
Teaching : Mathematical Modeling of Physical Problems, Thermalphysics of Nano-Systems

Education

From 2023 **Ph.D. of Thermophysics**, *Bauman Moscow State Technical University*, Moscow, Russia.
2021 – 2023 **Master of Thermophysics**, *Bauman Moscow State Technical University*, Moscow, Russia.
2019 – 2021 **Bachelor of Nuclear Power Engineering**, *Moscow Power Engineering Institute*, Moscow, Russia.
2017 – 2021 **Bachelor of Nuclear Engineering**, *North China Electric Power University*, Beijing, China.

Research Projects

PhD Research

2023 – 2027 **Fundamental research on the thermal transport mechanism of nanostructures**.
Advisor **Prof. V.I. Khvesyuk**

- Investigated **quantum confinement** effects to elucidate the microscopic mechanisms of anomalous low-temperature specific heat in nanostructures.
- Revealed the nature of **collective phonon transport** and proposed the novel concept of scattering sequence entropy to quantify scattering statistics.
- Developed a **phonon Monte Carlo** simulation tool for the thermal analysis of complex nanoelectronic architectures.

Publications

First Author Papers:

2025 **Shixian Liu**[#], Zhicheng Zong[#], Fei Yin, V.I. Khvesyuk*, and Nuo Yang*. Quantifying particle and wave effects in phonon transport of pillared graphene nanoribbons. ***International Journal of Thermal Sciences***, volume 217, page 110067, 2025, **(IF=5.0)**.

2025 **Shixian Liu**, Ge Zhang, Fei Yin, A.A. Barinov, V.I. Khvesyuk*, and Nuo Yang*. Temperature dependence of specific heat capacity of nanostructures via neuroevolution machine-learned potential. ***Journal of Applied Physics***, volume 138, page 104301, 2025, **(IF=2.5)**.

2025 **Shixian Liu**, Fei Yin, and V.I. Khvesyuk*. Investigating Anisotropic Three-Phonon Interactions in Graphene's Thermal Conductivity Using Monte Carlo Method. ***International Journal of Thermophysics***, volume 46, page 22, 2025, **(IF=2.9)**.

2025 **Shixian Liu** and V.I. Khvesyuk*. Temperature fluctuations in quantum dots: Insights from a T3/2 heat capacity model. ***Physics Letters A***, volume 534, page 130261, 2025, **(IF=2.6)**.

2024 **Shixian Liu**, A.A. Barinov*, Fei Yin, and V.I. Khvesyuk. Determination of thermal properties of unsmooth Si-nanowires. ***Chinese Physics Letters***, volume 41, page 016301, 2024, **(IF=4.2)**.

2022 **Shixian Liu**, Fei Yin, V.I. Melikhov*, and O.I. Melikhov. Validation of the STEG code using experiments on Two-Phase flow across horizontal tube bundles. ***Nuclear Engineering and Design***, volume 399, page 112048, 2022, **(IF=2.1)**.

Corresponding Author Papers:

2026 Fei Yin, **Shixian Liu***, Yiming Dong, A.A. Barinov, Ke Xu*, and V.I. Khvesyuk*. Accelerated phonon transport calculations for nanostructures: Combining neuroevolution potentials and compressed sensing. ***Journal of Applied Physics***, 2026, **(IF=2.5)**. [Under Revision].

Collaborative Papers:

2026 Zhihao Zhou, Yu He, **Shixian Liu**, Lina Yang*, and Nuo Yang*. Effect of Non-Fourier Heat Transport on Temperature Distribution in High Bandwidth Memory. ***IEEE Transactions on Electron Devices***, volume 73, pages 561–568, 2026, **(IF=3.2)**.

2026 Dongliang Ding, Linfeng Yu, Ke Xu, Ting Liang*, Wenkang Chen, Xin Wu, Haozhe Xu, **Shixian Liu**, Shuai Shao, Xin Huang, Huanping Wang, Guoxian Zhang, Haichang Guo, Yimin Yao, Guangzhao Qin, Yanhui Chen, Xiaoliang Zeng, Xiangfan Xu*, Ke Chen, Masahiro Nomura*, and Jianbin Xu*. Room-temperature phonon hydrodynamics induced by surface reconstruction in covalent monocrystalline nanowires. *Nature Communications*, 2026, **(IF=14.7)**. [Under Review].

2025 Fei Yin, **Shixian Liu**, A.A. Barinov, and V.I. Khvesyuk*. An enhanced framework for wave reflection from a periodically rough boundary. ***Physica B: Condensed Matter***, volume 716, page 417743, 2025, **(IF=2.8)**.

Fellowships & Awards

2023 – 2027 **CSC Scholarship**, 202308090243. (Full PhD's funding in Russian)

2021 – 2023 **CSC Scholarship**, 202108090102. (Full Master's funding in Russian)

2019 – 2021 **CSC Scholarship**, 201906730137. (Undergraduate International Exchange)

Academic Exchange

10/2025 **The 9th Workshop on Thermal Transport**, Changsha, China. (*Best Poster Award*)

06/2025 **XVIII All-Russian School-Conference "Current issues in thermal physics and physical fluid dynamics"**, Moscow, Russia. (*First Prize*)

10/2024 **VI International Conference "Mathematical modeling in materials science of electronic components"**, Moscow, Russia. (*Oral*)

07/2024 **The 8th Workshop on Thermal Transport**, Lanzhou, China. (*Oral*)

05/2024 **XVI Minsk International Heat and Mass Transfer Forum**, Minsk, Belarus. (*Oral*)

10/2022 **The 8th Russian National Conference on Heat Transfer**, Moscow, Russia. (*Poster*)

Computer Skills

Programming C++, Python, Matlab, Fortran

Tools VASP, QE, phono3py, ShengBTE, LaTeX, Git