Lyuwen Fu

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EXPERIENCE

Zhejiang Lab, Hangzhou, Zhejiang	
Senior Research Scientist in Center for Intelligent Computing	Jul 2022 – Present
EDUCATION	
Columbia University, New York, New York	
Ph.D. in Materials Science	Jan 2017 – Oct 2021
Advisor: Professor Chris Marianetti	
• Research Focus: Generic first-principle computation on phonons and phonon-pho	onon interactions
Thesis: Thermodynamics of Interacting Phonons	
Columbia University, New York, New York	
Master of Science in Materials Science	Sep 2015 – Dec 2016
• Cumulative GPA: 3.81 / 4.00	
Coursework: Solid State Physics, Computing Electronic Structure of Complex Ma Materials, Mechanical Behavior of Materials, etc.	terials, Theory of Crystalline
University of Science and Technology Beijing, Beijing, China	
Bachelor of Engineering in Materials Physics	Sep 2011 – Jun 2015
Adviser: Professor Jiao Teng	
• Thesis: Research on the Quantum Transport Properties of Resistive RAM	
• Cumulative GPA: 3.46 / 4.00	
RESEARCH	
Columbia University, New York, New York	
Department of Applied Physics and Applied Mathematics	May 2016 – Oct 2021
Project: Thermodynamics of interacting phonons	
Adviser: Professor Chris Marianetti	
• Develop group theoretical approach to extract arbitrary order phonons and their	r interactions in terms of
space group irreducible derivatives.	
• Develop finite difference algorithm which extracts all irreducible derivatives in the with the fewest possible calculations.	smallest possible supercells
• Develop software to compute thermal dynamic properties using the extracted pho	non interaction data.
• Perform high-throughput computations on HPC clusters.	
• Manage an in-house cluster of more than 80 nodes.	
University of Science and Technology Beijing, Beijing, China	
Undergraduate Thesis, Department of Materials Physics and Chemistry	Feb 2015 – Jun 2015
Project: Research on the Quantum Transport Properties of Resistive RAM	
Adviser: Professor Jiao Teng	
• Design the synthesis process and the pattern of ReRAM thin film. Realized the res	istive switch phenomenon
in ReRAM.	
• Research on the theoretical background of ReRAM and the mechanism and com	nditions for the Quantized
Anisotropic Magnetoresistance.	AM complex
• Study the resistive swhen properties and electron transport properties of the KeKA	Alvi samples.
 Undergraduate Student Research, Institute for Advanced Materials and Technology Project: Research on the Performance Study of One-dimensional IrO₂ Nano-Arra Adviser: Professor Huimin Meng 	Oct 2013 – May 2014 ay Electrochemical Sensor
• Develop a new method of the synthesis of the one-dimensional IrO_2 nanometer ar electrochemistry properties of the electrode.	ray electrodes and studied
SKILLS	

- Programming Languages: Proficient in Python, C/C++, Familiar with Objective-C, Java, C#, Fortran.
- First-principle Computation: VASP, Quantum ESSRESSO, Abinit.

• Other Softwares: LATEX, Docker, MATLAB, Mathematica, Blender, Adobe Photoshop.

RESEARCH INTERESTS

First-principle computation and simulation; Computational materials science; Phonon and phonon interactions; Materials thermodynamics and thermal transport; Condensed matter physics.

PUBLICATIONS

- 1. <u>Fu, L.</u>, Kornbluth, M., Cheng, Z., & Marianetti, C. A. (2019). Group theoretical approach to computing phonons and their interactions. *Physical Review B*, 100(1), 014303.
- 2. Bryan, M. S., <u>Fu</u>, <u>L</u>., et al. (2020). Nonlinear propagating modes beyond the phonons in fluorite-structured crystals. *Communications Physics*, 3(1), 1-7.
- 3. Ding, X., Yao, T., Fu, L., et al. (2020). Magnetic, transport and thermal properties of δ -phase UZr₂. *Philosophical Magazine Letters*, 1-11.
- 4. C.A. Dennett, ..., <u>L. Fu</u>, et al. (2021). An Integrated Experimental and Computational Investigation of Defect and Microstructural Effects on Thermal Transport in Thorium Dioxide, *Acta Mater.*, 213, 116934.
- 5. M. A. Mathis, A. Khanolkar, <u>L. Fu</u>, et al. (2022). Generalized quasiharmonic approximation via space group irreducible derivatives, *Physical Review B*, 106, 014314.
- 6. E. Xiao, H. Ma, M. S. Bryan, <u>L. Fu</u>, et al. (2022). Validating First-Principles Phonon Lifetimes via Inelastic Neutron Scattering, *Physical Review B*, 106, 144310.

CONFERENCES

- 1. Fu, L., Kornbluth, M., & Marianetti, C. A. (2018). An optimal approach to computing phonons and their interactions via finite difference. APS March Meeting 2018, X29.00006.
- 2. Fu, L., Kornbluth, M., Cheng, Z., & Marianetti, C. A. (2019). An optimal approach to computing phonons and their interactions via finite displacements. APS March Meeting 2019, H22.00003.
- 3. Fu, L., Mathis, M., Xiao, E., & Marianetti, C. A. (2020). Phonon interactions in rock salt and fluorite structures. APS March Meeting 2020, P44.00009. (*Meeting canceled due to COVID-19 pandemic*)