

Zhaofeng Peng

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EDUCATION

Peking University

Expected graduation date: Jul. 2025

Bachelor of Science in Theoretical and Applied Mechanics, Minor in Biomedical Engineering

Beijing, China

- **GPA:** Overall - 3.760/4.0
- **Ranking:** 2/15
- **Selected Coursework:** Ordinary Differential Equations, Theoretical Mechanics, Advanced Dynamics, Engineering Fluid Mechanics, Soft Matter Fluid Mechanics, Basic Physics Lab, Molecular Cell Biology, Physiology

RESEARCH EXPERIENCE

Exploration of the Formation of *Vibrio cholerae* Biofilm

Aug. 2024 - Sep. 2024

Advisors: Prof. Ying Li (UW-Madison) and Prof. Jing Yan (Yale)

University of Wisconsin-Madison

- Analysed LAMMPS simulation results on the formation of *V. cholerae* extracellular matrix using Python, obtaining crosslinking information of the network and polymer conformation of *Vibrio* polysaccharide
- Compared different simulation methods for bacterial cells and biofilm

Exploration of the Swelling Mechanism for Charged Soft Matter

Sep. 2023 - Present

Advisor: Prof. Guang Chen (PKU)

Peking University

- Investigated the relationship between electrostatic free energy and osmotic pressure of polyelectrolyte solutions, and derived a new set of formulae for osmotic pressure
- Compared the theoretical results with experimental data to explain the unresolved scaling laws
- Reevaluated the swelling mechanism of polyelectrolyte gels from the perspective of energy minimization, considering the electrostatic free energy and elastic energy of the polymer network
- Developed a new model to explain the swelling behavior of red blood cells, considering the bending energy of the membrane and the electrostatic energy of the system

Porous Hydroxyapatite Ceramic Designing

Sep. 2023 - Jan. 2024

Course Project

Peking University

- Investigated methods for preparing porous ceramics, and used the wet sponge method to fabricate hydroxyapatite ceramics for laboratory mouse skull repair
- Attempted to prepare ion-doped hydroxyapatite using the ion exchange method

PUBLICATIONS AND MANUSCRIPTS

Swelling of Spherical Polyelectrolyte Gels

Mingyu Duan, Jiadong Chen, Yiming Liu, **Zhaofeng Peng**, Guang Chen

🔗 doi.org/10.1007/s10118-024-3152-2

Osmotic Pressure of Polyelectrolyte Solutions: A Derivation from Electrostatic Free Energy (In Preparation)

Zhaofeng Peng, Guang Chen

Erythrocyte: Relationship between Equilibrium Shape and External Salt Concentration (In Preparation)

Zhaofeng Peng, Guang Chen

TECHNICAL SKILLS

Technologies & Tools:

Proficient in MATLAB, SolidWorks. Experienced in COMSOL, LAMMPS, Blender, Unity.

Programming Languages:

Proficient in L^AT_EX. Experienced in C, Python, HTML.

AWARDS AND HONORS

Award for Academic Excellence (PKU)

Dec. 2023

Peking University Scholarship, Third Prize

Dec. 2023

National College Student Physics Competition for Selected Regions, Third Prize

Dec. 2023

China Mechanics Competition in Honor of Zhou Peiyuan, Honorable Mention

Aug. 2023

Chinese Chemistry Olympiad in Provinces, First Prize

Oct. 2020