

1–2 Fully Funded PhD Positions

Scientific Machine Learning & Computational Physics

Department of Mechanical Engineering, Iowa State University

PHASE Lab, PI: Prof. Pan Du



Fall 2027 Admission · Fully Funded (Tuition + Stipend) · Rolling Review

The **PHASE** Lab, short for **Physics & Health via AI and Shape Emulation**, in the Department of Mechanical Engineering at Iowa State University is recruiting **1–2 fully funded PhD students** starting in **Fall 2027**. Students will work at the intersection of AI and computational science. Interested applicants are encouraged to contact the PI in advance of application submission.

About the PI and Research Group

Prof. Pan Du, currently a Postdoctoral Researcher at UC Berkeley, will join Iowa State University as an Assistant Professor in Fall 2027 and establish the **PHASE** Lab. The lab aims at developing next-generation AI and geometry modeling methods for computational physics and biomedical applications.

Research directions include:

- Scientific machine learning for computational physics,
- AI-driven digital twins for biomedical systems,
- Hybrid neural modeling for design, inverse problems, optimization, and uncertainty quantification (UQ),
- Foundational AI methods for scientific computing.

Why PHASE Lab?

Prof. Du has published 20+ first/co-authored papers in *Science Advances*, *Nature Communications*, *Computer Methods in Applied Mechanics and Engineering*, and other leading journals. His research lies at the intersection of AI, computational physics, and biomedical engineering, with strong interdisciplinary and real-world impact potential. Prof. Du actively encourages both intra-group and external collaborations, including collaborations with University of Notre Dame and UC Berkeley. Prof. Du emphasizes hands-on, interest-driven mentoring and aims to build a vibrant, flexible, collaborative, and supportive research environment. Prof. Du also strongly supports student conference travels and networking opportunities to help students maximize their future career development.

Why ISU?

Iowa State University is a leading R1 research institution with strong programs in mechanical engineering. The Department of Mechanical Engineering is one of the largest engineering departments at ISU, with strong research activities spanning fluid mechanics, thermal sciences, mechanics, manufacturing, robotics, and computational engineering. Iowa State also provides outstanding access to interdisciplinary collaborations, national laboratory partnerships, and advanced computing resources. Ames, home of Iowa State University, consistently ranks among the best college towns in the United States and offers a highly collaborative, affordable, safe, and supportive academic environment.

Potential Research Areas for PhD Students

Research directions may be tailored to student interests. Potential topics include:

- Data-driven and physics-based machine learning for PDE systems,
- AI-powered medical image processing and patient-specific shape modeling,
- Differentiable and hybrid neural modeling for optimization and UQ,
- Generative AI, agentic AI, and foundation models for scientific computing.

Qualifications

Minimum Requirements

- Strong motivation, curiosity, and commitment to research.
- B.S. or M.S. in Mechanical Engineering, Aerospace Engineering, Biomedical Engineering, Applied Mathematics, Computer Science, Physics, or related fields.
- Experience or strong interest in computational methods, machine learning, and scientific programming.

Preferred Qualifications

One or more of the following is desirable:

- Background in fluid mechanics, computational physics, or scientific computing.
- Experience with medical image processing and biomechanics.
- Experience with machine learning, deep learning, or scientific AI.
- Programming experience in Python, JAX, Julia, PyTorch, C/C++, or related tools.
- Experience with Bayesian methods, inverse problems, and UQ.

Application Instructions

Interested applicants should email the following materials to panai4health@berkeley.edu:

- CV / Resume
- A brief summary of research experience, skills, and interests

Applications will be reviewed on a rolling basis until the positions are filled. International applicants are warmly welcome. Please check the [Iowa State University Mechanical Engineering Graduate Program website](#) for official application procedures and deadlines.

Prof. Pan Du's Website: www.panai4science.com