3 PhD opportunities in Probabilistic & Physics-Based Machine Learning

(Physics / Engineering / Maths / Computer Science / Computational Science)

The newly founded Bayesian & Physics-Based Machine Learning Lab at Purdue University, led by Prof. Sascha Ranftl, is recruiting three fully funded PhD students starting Fall 2026. As founding members, you will shape the scientific and cultural DNA of a new research group working at the frontier of machine learning, physics, engineering and scientific computing. Join this unique opportunity in shaping the future of AI 4 Science & Engineering at one of the world's leading engineering schools with >50k students and $3B annual budget.

Why Purdue?

- Prestigious College: Purdue's College of Engineering and the School of Mechanical Engineering are consistently ranked among the Top 10 in the United States and Top 50 worldwide across Engineering[1,2,3]. Purdue produced 7 Nobel laureates (13 affiliates), 1 Turing Award and 27 astronauts, incl. Neil Armstrong.
- Resources: Students will have access to state-of-the-art supercomputing (including the new Gautschi supercomputer), interdisciplinary collaborations, and initiatives like Purdue Computes, the Institute for Physical AI and the Lilly Endowment-Purdue Research Collaboration.
- Global Reach: A PhD from Purdue opens doors to leading roles in academia and industry worldwide.

Research Areas

Candidates may focus on one or more of the following themes:

1. Foundations of Physics-Based & Bayesian Machine Learning: Theoretical fundamentals linking Bayesian probability, stochastic processes, and deep learning.
2. Bayesian Uncertainty Propagation & Surrogate Modeling: Developing new probabilistic methods with applications to computationally intensive simulations and experimental data.
3. Applications in Engineering: E.g. fluid mechanics, biomechanics, energy systems, spaceflight in collaboration with the departments of biomedical engineering, aerospace engineering, computer science, etc.

What We Offer

- Fully funded PhD (tuition, stipend, benefits)
- Direct mentorship and close collaboration with Prof. Ranftl
- Opportunity and freedom to explore and develop your own ideas within the lab's vision. The level of guidance vs. freedom will be gauged to the individuals' preferences.
- A supportive, international, and interdisciplinary research environment. Collegial atmosphere aimed at YOUR growth and success. The Lab's success = YOUR success.

Your Profile

- Background in physics, engineering, mathematics, computer science, statistics, or related fields
- Strong mathematical aptitude, strong computational and programming skills (Python or similar)
- Strong interest in interdisciplinarity
- Curiosity, creativity, critical thinking and motivation to tackle fundamental and applied problems

How to Apply

- Priority deadline: December 1, 2025. Apply via the Purdue ME Grad Program and indicate faculty preferences.
- Informal consultation: Send an email to the PI (sranftl@purdue.edu) with subject [Inquiry Lab Founding Member - YOUR FAMILY NAME], containing a single PDF including: CV, cover letter on research interests and experience (1–2 pages), transcripts of records, contact info for 2–3 references.
- Further information, full job description and Purdue ME Graduate School at:
  https://sites.google.com/view/sascha-ranftl/open-positions
  https://engineering.purdue.edu/ME/Graduate

[1] https://www.topuniversities.com/university-subject-rankings/engineering-technology
[2] https://www.usnews.com/best-graduate-schools/top-engineering-schools/eng-rankings
[3] https://www.timeshighereducation.com/world-university-rankings/2025/subject-ranking/engineering