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Simon Pfahler

PhD Student,
University of Regensburg

Developing machine learning methods for computational physics and biomedical applications

Languages

German	Native
English	C1
French	B2
German Sign Language	A1

Skills

- Python
- LaTeX
- C++
- Git
- CAD

Extracurricular activities

Volunteer, Challenge Roth
Parking logistics & team coordination

Developer, LaTeX-Package
colorblind – Making colorblind-safe documents easy in LaTeX

Awards & Fellowships

2026: Fellow, Lindau Nobel Laureate Meetings
2024-present: Fellow, German Academic Scholarship Foundation
2024-present: Fellow, Marianne-Plehn-Programme
2024: Studienabschlusspreis, University of Regensburg
2023: Preis der guten Lehre, University of Regensburg
2018-2024: Fellow, Max-Weber-Programme
2018: Abiturpreis Mathematik, German Mathematical Society

Education

PhD in Physics	University of Regensburg — 2024-present
M.Sc. in Physics	University of Regensburg — 2023
Internship	Max Planck Institute for the Science of Light — 2022
Exchange semester	University of Southern Denmark — Aug 2021 – Jan 2022
B.Sc. in Physics	University of Regensburg — 2021

Research Experience

PhD project
Developing gauge-equivariant neural-network methods to accelerate particle physics simulations

PhD side project (Funded by Marianne-Plehn-Programme)
Extending M.Sc. work on Mutual Hazard Networks with a novel cluster-based approach to model inference

M.Sc. thesis
Proposed a new statistical measure for low-rank tensor approximations of probability distributions

Internship, Max-Planck Institute
Developed a neural network to learn symbolic differential equations from experimental data

Publications

Hu Y. L. et al., *Quantifying Uncertainty of Predictions from Cancer Progression Models*, Bioinformatics (2026)
Pfahler S. et al., *A novel gauge-equivariant neural network architecture for preconditioners in lattice QCD*, PoS Lattice 2025 (2026)
Pfahler S. et al., *A Scalable Framework for Pan-Cancer Tumor Evolution Analysis Enables Transfer of Progression Mechanisms Across Tumor Entities*, bioRxiv (2026)
Pfahler S. *Easy colorblind-safe typesetting: General guidelines and a helpful LaTeX package*, TUGboat **45:2** (2024)
Pfahler S. et al., *Taming numerical imprecision by adapting the KL divergence to negative probabilities*, Stat. Comput. **32** (2024)
Rupp K. et al., *Modeling metastatic progression from cross-sectional cancer genomics data*, Bioinformatics **40** (2024)
Schill R. et al., *Reconstructing Disease Histories in Huge Discrete State Spaces*, Künstl Intell **39** (2024)

Posters & Presentations

Lattice 2026: *Machine-Learning-Accelerated Multigrid Setup for Lattice QCD Dirac Solves*

HISKP seminar Bonn 2026: *Neural-network approaches for preconditioning the Dirac equation in lattice QCD*

Lattice 2025: *A novel gauge-equivariant neural network architecture for preconditioners in lattice QCD*

RECOMB 2025: *Exploiting weak modularity in cancer progression to infer large Mutual Hazard Networks*

COMPSTAT 2024: *Taming numerical imprecision by adapting the KL divergence to negative probabilities*

TUG 2024: *Easy colorblind-safe typesetting*

MECO 2024: *Taming numerical imprecision by adapting the KL divergence to negative probabilities*

ISMB 2023: *Using low-rank tensor formats to enable computations of cancer progression models in large state spaces*

Teaching

SS 26: Quantenelektrodynamik (Übungsgruppenleiter)

WS 25/26: Einführung in die Quantenmechanik (Übungsgruppenleiter)

SS 25: Quantenstatistik (Übungsgruppenleiter)

WS 24/25: Einführung in die Quantenmechanik (Übungsgruppenleiter)

SS 24: Quantenelektrodynamik (Übungsgruppenleiter)

WS 23/24: Einführung in die Quantenmechanik (Übungsgruppenleiter)

SS 23: Theoretische Elektrodynamik (Übungsgruppenleiter)

WS 22/23: Fortgeschrittene Quantenmechanik (Übungsgruppenleiter)

SS 22: Anfängerpraktikum 2: Elektrodynamik (Praktikumsbetreuer)