JONAS **SPINNER**
CURRICULUM VITAE

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RESEARCH INTERESTS

- ML for particle physics — Solving technical problems at the LHC and beyond
- Generative modelling — Flow matching, autoregressive transformers, finetuning strategies
- Geometric deep learning — Lorentz-equivariant graph networks and transformers

EDUCATION

PhD in Physics — Heidelberg University — 10/2022 – Exp. 09/2025
- Topics: ML for the LHC, generative modelling, Lorentz-equivariant networks

MSc in Physics — Karlsruhe Institute for Technology — 1.1* — 10/2020 – 09/2022
- Thesis: New Light Particles in Astrophysics, Cosmology and at Colliders
- Visited the Institute for Particle Physics Phenomenology (Durham) for 5m during the MSc Thesis

BSc in Physics — Karlsruhe Institute for Technology — 1.1* — 10/2017 – 09/2020
- Thesis: Dimension 7 operators in Tritium Beta Decay

Abitur — Robert-Gerwig Gymnasium Hausach — 1.0* — 06/2017

*German grading scale: from 1.0 (best) to 6.0 (worst)

TEACHING

Co-supervision MSc thesis Sebastian Pitz — 07/2024 – Exp. 06/2024
- Topic: Lorentz-equivariant graph networks with the tensorframes approach

Lecturer at Erum Datahub Active Training Course on Advanced Deep Learning — 05/2024
- Delivered a 90-minute lecture on Transformers for 50 students

Head teaching assistant for Master-level course Machine Learning and Physics — 10/2023 – 03/2024
- Organization of exercises and exams for 120 students

Co-supervision BSc thesis Nathanael Ediger — 06/2023-10/2023
- Topic: LHC Event Generation with JetGPT - From variable orderings to joint training

Teaching assistant for 7 one-term courses in Theoretical Physics — 04/2019 – 09/2023
- Discussions and marking for groups of 10-20 students

WORKSHOPS AND CONFERENCES

ML4Jets 2024	Paris, France	11/2024
Young Scientists Meeting of the CRC TRR 257	Karlsruhe, Germany	09/2024
PHYSTAT – Statistics meets Matching Learning	London, United Kingdom	09/2024
EuCAIFCON 2024	Amsterdam, Netherlands	04/2024
Workshop on Machine Learning and High-Energy Physics	Wien, Austria	12/2023
ML4Jets 2023	Hamburg, Germany	11/2023
IRN Terascale	Marseille, France	10/2023
Young Theorists Forum 2022	Durham, United Kingdom	12/2022

DOCTORATE SCHOOLS

TASI 2024 - The Frontiers of Particle Theory	Boulder, Colorado, US	06/2024
Machine Learning in Particle Theory - MITP Summer School	Mainz, Germany	06/2023
Active Training Course on Advanced Deep Learning	Meinerzhagen, Germany	11/2022

SKILLS

Technical — Python, PyTorch, git, Wolfram Mathematica
Languages — German (native), English (fluent)

AWARDS

- Prestigious German Studienstiftung scholarship (top 0.5% of all German students)
- Deutschlandstipendium scholarship (awarded to top-performing students across Germany)

PUBLICATIONS

[1] J. Brehmer, V. Bresó, P. de Haan, T. Plehn, H. Qu, J. Spinner and J. Thaler, *A Lorentz-Equivariant Transformer for All of the LHC* (2024), arXiv:2411.00446

[2] J. Spinner, V. Bresó, P. de Haan, T. Plehn, J. Thaler and J. Brehmer, *Lorentz-Equivariant Geometric Algebra Transformers for High-Energy Physics* (2024), Accepted at NeurIPS 2024, arXiv:2405.14806

[3] C. A. Manzari, J. Martin Camalich, J. Spinner and R. Ziegler, *Supernova limits on muonic dark forces*, Phys. Rev. D **108**, 103020 (2023), doi:10.1103/PhysRevD.108.103020, arXiv:2307.03143

[4] A. Butter, N. Huetsch, S. Palacios Schweitzer, T. Plehn, P. Sorrenson and J. Spinner, *Jet Diffusion versus JetGPT – Modern Networks for the LHC* (2023), Under review at SciPost, arXiv:2305.10475

[5] M. Bauer, G. Rostagni and J. Spinner, *Axion-Higgs portal*, Phys. Rev. D **107**, 015007 (2023), doi:10.1103/PhysRevD.107.015007, arXiv:2207.05762