

Research Scientist (PhD or Postdoc) in AI for Physics

(Up to 4 positions on PhD- or Postdoctoral level; initial term of 2–3 years)

The **Data Science Lab** of **Prof. Lucie Flek** at the **University of Bonn** and the **Lamarr Institute of Machine Learning and Artificial Intelligence, Germany**, with an international profile in natural language processing, large language models, and AI safety, is currently **expanding its research profile toward Artificial Intelligence for Physics**. We invite applications for several **Excellence-Cluster-, BMFTR ErUM-Data-, DFG-, and EU-funded positions** at the **PhD or Postdoctoral level**.

Our AI-for-Physics activities are embedded in major national and European research initiatives, including the **Excellence Cluster “Dynaverse – Our Dynamic Universe”**, **BMFTR ErUM-Data** research collaboration projects on **AI safety (AALearning, with Bonn and RWTH physics depts) and LLMs for physics** (with TU Dortmund, DESY, FZ Jülich, Leibniz Institute for Astrophysics Potsdam, and more), and **DFG-funded research on hyperbolic representations**. The group of Prof. Flek is part of the **ELLIS European AI research network** and offers an internationally visible research environment.

We welcome applications in the following **three core research areas**:

1. **Physics Foundation Models & Scientific Representation Learning**
Self-supervised and physics-aware foundation models for gravitational waves, particle physics, and astrophysics; contrastive and predictive pretraining; equivariant architectures; cross-detector generalization.
2. **Uncertainty, Robustness & Epistemic Safety for AI in Physics**
Uncertainty estimation, calibration, domain shift, out-of-distribution detection, adversarial robustness, and safety evaluation of deep learning systems in safety-critical scientific settings.
3. **LLM-Based Scientific Agents & Automated Physics Workflows**
LLM-based tools for literature-driven hypothesis generation and verification, equation extraction and symbolic manipulation, tool-augmented reasoning with simulators and analysis code, multi-agent verification, and provenance-aware scientific workflows.

We are looking for **outstanding PhD or postdoctoral candidates** with a strong background in **physics, machine learning, natural language processing, statistical modeling, or scientific computing**. We highly appreciate **strong programming skills (Python, PyTorch/JAX)**, experience with large datasets or simulations, engagement with **open-source projects**, strong communication skills in **English**, and the ability to work effectively in an **interdisciplinary setting**. German language skills are welcome but **not required**.

[The group](#) is embedded in a **highly collaborative research environment in Germany** with strong links to national and European physics and AI collaborations and high-performance computing centers. We place strong emphasis on **methodological rigor, reliability, open and reproducible research, and close interaction between physics and AI**. The position requires that the successful candidate can **reside in Germany**; remote employment from abroad is not possible.

PhD positions: TV-L E13, **75%**, typically **3–4 years**.

Postdoctoral positions: TV-L E13/E14, **100%**, typically **2–3 years**.

Start date: Flexible, preferably March 1, 2026. **Location:** Bonn, Germany.

We value and actively promote diversity in our team and therefore welcome all applications – regardless of age, gender, nationality, ethnic and social background, religion, worldview, disability, sexual orientation, or identity. Applications from women and non-binary candidates are explicitly encouraged. Applicants with severe disabilities will be given preference in the case of equal qualification and professional performance. Our tasks are diverse and adaptable – for applicants with disabilities, we will jointly find solutions that optimally foster their abilities.

To apply, please submit a **CV**, a **motivation letter** describing your research interests and preferred topic area(s), a **short summary of previous research or projects**, and the **names of up to three referees** (if available) to flek@bit.uni-bonn.de.

The first application deadline is **December 13th, 2025**.

However, applications are reviewed on a **rolling basis** until all positions are filled.