

PHYSICS COLLOQUIUM

Speaker: **Prof. Lukas Heinrich**
Data Science in Physics,
Technische Universität München



Topic: **Entering the Scaling Era of AI In Particle Physics**

Time and Tuesday, July 7, 2026, **2:50 pm** – hybrid event

place: **The colloquium will be held in REC/C213.**

Online participation possible:

Zoom-Meeting: Meeting-ID: 674 4304 6840 / passcode: PC-SoSe26

<https://tu-dresden.zoom-x.de/j/67443046840?pwd=QAEHLWawl2P3iDmQToOSHhNYgu3Fzz.1>

Host: Prof. Frank Siegert

Abstract: Particle Physics has long been tightly coupled to advanced computational techniques due to the complexity of the theory and experiments that originate which are required to bridge the indirectness of the field: to study the smallest constituents of matter, we must build some of the largest experiments ever constructed. Within the last decade the rapid advancements in machine learning and artificial intelligence have not only pushed the capabilities of experimental data analysis techniques far beyond what was previously deemed possible but increasingly evidence is mounting that the fundamental limit to sensitivity may still be far away. The key to these developments is the emergence of "Scaling Laws", which have been the driving force in the rise language models and have recently been observed in particle physics data as well. In this talk I will review recent progress across both of these frontiers and discuss possible future directions.

Bio: Prof. Heinrich holds the "Professorship for Data Science in Physics" at the School of Natural Sciences at the Technical University of Munich. After his PhD in 2019 from the University of New York, he was a CERN Fellow and Staff Scientist, before joining TUM. His research background is particle physics, where, as a member of the ATLAS experiment at the Large Hadron Collider (LHC) at the CERN. In this context he is developing novel data analysis methods that combine physical knowledge and artificial intelligence, for which he has also been awarded an ERC Starting Grant.