PHYSIKALISCHES KOLLOQUIUM

Sommersemester 2026

Das Kolloquium findet (soweit nicht anders angegeben) **jeweils montags um 14:15 Uhr im Röntgen-Hörsaal** des Physikalischen Instituts, Hubland Campus Süd, Universität Würzburg **und online via Zoom statt**.
Zugangsdaten siehe https://www.physik.uni-wuerzburg.de/aktuelles/veranstaltungen-aus-der-physik/physikalisches-kolloquium/

13.07.2026

Prof. Dr. Tobias Osborne
Leibniz-Universität, Hannover, Machine Learning

Large language models: A physicist's perspective

Abstract

In Q4 2025, LLM-based tools quietly crossed a threshold: with the right workflow, a single researcher can now produce formally verified scientific results at a rate previously requiring a small research group. In this talk I will present a physicist-friendly introduction to large language models. Starting with the transformer as a stateless function whose output is made stochastic by sampling, I will explain how, with the foundation of a raw cURL call to an API, one can strip away the hype and mystery and rebuild the agent stack from first principles: chat as scaffolded API calls, agents as while loops with tool calls, context management as the reason chat interfaces silently ruin your results, bash polling loops as infrastructure, and multi-agent orchestration as the natural endpoint. I will also explain why and how you should be skeptical: getting reliable research output from these tools requires deliberate practice, and an understanding of their limitations. The gap between "I tried ChatGPT and it hallucinated" and "this is a powerful force multiplier and accelerator for research" is not closed by better models. It is closed by technique and domain expertise. I will attempt a little live coding, no promises though!

Für die Dozentinnen bzw. Dozenten der Fakultät

Prof. Dr. Neuenfeld, Dr. Feichtner, Dr. Ünzelmann, Hr. Plote, Hr. Schwarzkopf