



# Kolloquium Boden, Wasser, Luft

**17. November 2022, 16:15 – 18 Uhr**  
**Hörsaal Fahnenbergplatz, Friedrichstr. 39**

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## **Neural networks in hydrology – Turning point or just another tool?**

Modern machine learning methods have made enormous scientific progress in recent years and have fundamentally altered entire scientific disciplines. Particularly, artificial neural networks have played a crucial role in this process. This change is also apparent in hydrology, and numerous studies in recent years have shown that neural networks are among the best available models for a wide range of hydrological problems. However, in contrast to their excellent predictive performance, is the theoretical understanding of neural networks still insufficient and countless questions about their optimal architecture, training or predictive uncertainties remain up-to-date unanswered. The aim of my presentation is therefore to create a common knowledge base how neural networks learn and predict in order to better understand the current hype, limitations and new possibilities of neural networks in hydrological research. In my presentation I will hence:

- 1) briefly summarize state-of-the-art network-based hydrological research,
- 2) explain the main concepts behind modern neural networks and
- 3) finally show ongoing research that highlights their possibilities but also their limitations.

**Veranstaltet von den Professuren für Bodenökologie, Hydrologie,  
Umwelthydrosysteme und Umweltmeteorologie der Universität Freiburg**