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The New World of Deep Learning: From Hybrid Approaches to Explainability

Despite the outstanding success of deep neural networks in real-world applications, ranging from science to public life, most of the related research is empirically driven and a comprehensive mathematical foundation is still missing. At the same time, these methods have already shown their impressive potential in mathematical research areas such as imaging sciences, inverse problems,

or numerical analysis of partial differential equations, sometimes by far outperforming classical mathematical approaches for particular problem classes.

The goal of this talk is to first provide an introduction into this new vibrant research area. We will then survey recent advances on novel hybrid deep learning-based approaches to solve inverse problems and partial differential equations. Finally, we will present results on how the results of deep neural networks can be flexibly and reliably explained.



**Prof. Dr. Gitta
Kutyniok**

Ludwig-Maximilians-
Universität München

**October 8, 2021
13:00 – 14:00 h**

<https://us02web.zoom.us/j/89643956089>