

PiAI Seminar Series: Physics informed AI in Plasma Science
9:30-10:30, 24 January 2022 (CET)
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Web Seminar

On scientific machine learning of kinetic theory and fluid dynamics

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In this talk, I will talk about the momentum built by machine learning methods in computational sciences. Specific attention will be paid on the usage of deep neural networks as building blocks in a numerical method to solve the Boltzmann-type kinetic equations. This is a particularly interesting topic since the high-dimensional integro-differential equation possesses an intricate structure that a numerical method needs to preserve. Thus, artificial neural networks might be beneficial but cannot be used out-of-the-box. The ongoing project is dedicated to touches upon the applications point of view of deep learning with a focus on interpretability and robustness, and on the mathematical methodologies point of view to solve partial differential equations.