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# Physics-Based Machine and Deep Learning for PDE Models

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## Message from the Guest Editors

The availability of increasingly large amounts of data, either from observations or from simulations, and the successes witnessed by ML methods on large size or large dimensional problems has opened the way for exploring the data driven modeling of complex dynamical physical phenomena. ML based techniques may accelerate simulations, acting, for example, as reduced models. More generally, a promising direction consists in integrating physics-based models with machine learning.

An additional challenge is the shift from academic case studies to realistic problems representing complex phenomena. Current solutions are most often demonstrated on simulated problems and there is still a large gap between academic and real-world developments.

This Special Issue, therefore, aims to gather specialists from different disciplines and to enable the dissemination of their recent research at the crossroad of model based and data based dynamical physical system modeling and on "physically inspired" ML models for dynamic systems.

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## Message from the Editor-in-Chief

The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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