Special Issue

Machine Learning Applications in Subsurface Flow Characterization

Message from the Guest Editor

Prediction of subsurface flow and transport is essential in many energy and environmental applications such as enhanced hydrocarbon recovery, CO2 geo-sequestration, groundwater flow, and contaminant transport. Given the intrinsic spatial heterogeneity of the subsurface environment and the nonlinearity of governing equations of fluid flow, the prediction of subsurface flow using high-fidelity computational fluid dynamics techniques becomes challenging in terms of computational complexity and cost. Data-driven and machine learning tools can potentially tackle these challenges by offering computationally efficient alternatives to physics-based models. This Special Issue aims to bring together papers demonstrating the advancement of machine learning-based proxy models with the focus on forward and inverse problems related to subsurface flow and transport. We highly encourage studies on scientific machine learning frameworks such as physics-constrained deep learning algorithms, which incorporate scientific computing and data-driven models in subsurface flow problems.

Guest Editor

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Energies is an international, open access journal in energy engineering and research. The journal publishes original papers, review articles, technical notes, and letters. Authors are encouraged to submit manuscripts which bridge the gaps between research, development and implementation. The journal provides a forum for information on research, innovation, and demonstration in the areas of energy conversion and conservation, the optimal use of energy resources, optimization of energy processes, mitigation of environmental pollutants, and sustainable energy systems.

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