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Machine Learning for Extreme Events

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Deadline for manuscript submissions:
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Message from the Guest Editors

Extreme events, such as heat waves, droughts, wildfires, floods, landslides, tornadoes, and hurricanes, are of interest worldwide due to their social, ecological, and technical impacts. Novel scientific machine learning approaches have been introduced and integrated with success and have the potential to enable transformational advances in the efficiency and effectiveness of predicting and managing earth system extremes by automatically learning multiphysics and multiscale processes based on observational or simulation data and extracting meaningful metrics for making decisions. We seek contributions in ML-based extreme event analyses which include but are not limited to: data engineering to make extreme events information findable, accessible, interoperable, and reusable (FAIR) for ML; exploratory data analysis, pattern recognition, and signature discovery for extreme event understanding; system complexity reduction or identification of influential drivers of extremes; and physics-informed ML and ML-guided numerical modeling, experimental design, and decision-making.

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Message from the Editor-in-Chief

Continued developments in instrumentation and modeling have driven atmospheric science to become increasingly more complex with a deeper understanding of concepts, mechanisms, and interactions. This is the field that innovation built and it has led to a better appreciation for the complexity with atmosphere. Human life is intertwined in this complexity as we strive to better understand our atmosphere. Climate change is constantly stretching the limits of our thinking and forcing new ideas and concepts to be played out. Welcome to the Anthropocene!

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